SOFTEK

SANView

Vixel Module Ref Guide

FUJITSU

SOFTEK SANView

Revision Notice

This is the second release of this manual. A complete revision history is provided at the end of the manual.

Abstract

The *Softek SANView Vixel Module Reference Guide* (ML-144957-002) describes features and functionality of Vixel devices, Softek SANView windows and dialog boxes used for Vixel devices, and Vixel-specific parameters.

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Preface

Description of the Manual

This manual describes:

- Features and functionality of Vixel devices
- Softek SANView windows and dialog boxes used for Vixel devices
- Vixel-specific parameters.

If you have any questions or need more information, please contact your Fujitsu Softek representative.

Audience for this Manual

This manual is intended for Softek SANView customers and Softek SANView support personnel.

Contents of this Manual

Chapter	***Describes***
Introduction	What is Softek SANView?
Historical Traffic Monitor Window	The Historical Traffic Monitor Window
Firmware Image Configuration Dialog Box	The Firmware Image Configuration Dialog Box
Schedule Tasks Option	The Zone Scheduler Dialog Box
Trap Configuration Dialog Box	The Trap Configuration Dialog Box
Manage Licenses Dialog Box	The Manage Licenses Dialog Box
Switch Window	Title Bar, LED Row, and Icons, File Menu, View Menu, Options Menu, Tools Menu, Help Menu, Interpreting the FC4 Type Value
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Hub Window	Title Bar, LED Row, and Icons, File Menu, View Menu, Options Menu, Tools Menu, Help Menu
Port Window	Hub Port Window
Configure the Hub Dialog Box	File Menu, Help Menu, Zoning Tab, Policies Tab
Hub Diagnostics Dialog Box	Sweep, Loop, and Port Tabs

Notation Conventions

Softek SANView Notations

Item	***Convention***	***Example***
alias	text	"...device alias, tape1..."
application	text	aplpkg
command	bold, uppercase	**CONNECT** causes...
computer	text	"...two computers, machine_a and B1."
database	when a path when named else text	/aaa/bbbb/,/ccc, database... ...database named db1. ...alpha database...
default	text underscore	"...default for TIME is NO." TIME=YES|<u>NO</u>
field	monospace, upper case	The DISTRICT field on the System View display...
file name	text	Robotlog.dat performs... The tstdata file is named Robotlog.dat. ...uses the Robotlog.dat file to...
Windows file path	text	c:\Softek SANView\tables
Unix file path and commands	text in Courier format, bold	/etc/init.d/volmgt stop
keyboard entry	text, uppercase	Press the ENTER key.
parameter/keyword	monospace, UPPER CASE	PAUSE keyword...NODEID parameter...
program	text	Use Sentutil.exe to... ...uses the program named Sentutil.exe ...uses the Sentutil.exe program to...

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Notices

At different locations throughout this manual information may appear in notes as follows:

☞ **NOTE:**
This note clarifies or emphasizes text that precedes or follows it.

Related Publications

The following publications contain related information.

Softek SANView User's Guide
(ML-144912-002)

Softek SANView Software Installation & Release Notes (SIRN)
(ML-144915-002)

■ ■

1

Introduction

- What is Softek SANView? 3

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What is Softek SANView?

Softek SANView manages heterogeneous multi-vendor SANs, streamlining SAN management through the following features:

- Automatically detects and discovers host bus adapters (HBAs) and Fibre Channel Management Integration MIB (Fibre Alliance MIB)-compliant switches, hubs, routers, bridges, disks, and arrays in the SAN for management; collects and interprets management data; and allows you to launch alternate management tools (such as Telnet or Web-based tools).
- Monitors and displays the health of the interconnections between SAN devices.
- Scales easily (through its advanced architecture) to accommodate updates of Softek SANView Modules. A Softek SANView Module is a software subset that allows Softek SANView to discover, monitor, and manage specific SAN devices. Options include specialized discovery, data collection and interpretation, graphical user interfaces, and launch of alternate management tools.
- Integrates with and reports events to Enterprise Management Applications such as CA Unicenter (when related Softek SANView Integration Module is installed).
- Quickly troubleshoots and isolates problems through health monitoring, user-filtered event logs, and advanced diagnosis capabilities. These features help you quickly identify, isolate, and fix issues to keep your SAN operating reliably.
- Manages agents out-of-band to facilitate SAN management configuration, allow remote management capability, and ensure continually available management data (even if parts of the SAN transport are down).
- Proactively monitors status and detects problems at every level, notifying administrators via email when failure-marked events occur. All events are shown in the SAN Events frame as well. The health of all SAN devices is continually monitored and displayed.
- Tracks bandwidth usage with configurable traffic threshold alerts for easy capacity planning.
- Secures both monitoring and management options through user-defined passwords, passed between Client and Server through the MD5 encryption algorithm. (MD5 is Message Digest 5, a public one-way hash function used for password encryption. MD5 is defined in RFC 1321.)
- Runs on UNIX and Windows®.

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Historical Traffic Monitor Window

- The Historical Traffic Monitor Window 7

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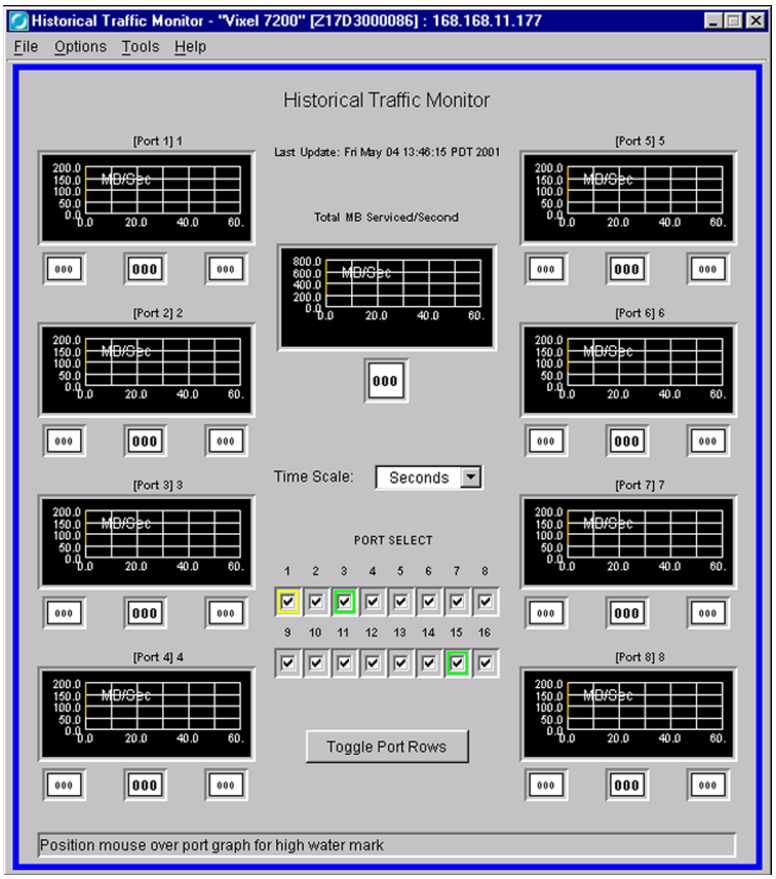
This section describes the information shown in Softek SANView's Historical Traffic Monitor dialog box, which can be opened from Vixel hub and switch windows through the View menu.

The Historical Traffic Monitor Window

The Historical Traffic Monitor window for Vixel Switches is shown below.

Historical Traffic Monitor window for a Vixel 7200


Historical Traffic Monitor - "Vixel 7200" [Z17D3000086] : 168.168.11.177
File Options Tools Help
Historical Traffic Monitor
Last Update: Fri May 04 13:46:15 PDT 2001
Total MB Serviced/Second
[Port 1] 1
[Port 2] 2
[Port 3] 3
[Port 4] 4
[Port 5] 5
[Port 6] 6
[Port 7] 7
[Port 8] 8
MB/Sec
Time Scale:
Seconds
PORT SELECT
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
Toggle Port Rows
Position mouse over port graph for high water mark

☞ **NOTE:**
Only frame data is measured; LIPs, ARBs, and IDLEs are ignored.

The port gauges on the Hub window, Switch window, and Historical Traffic Monitor window measure port traffic differently depending on the device; switch gauges display a rate while hub gauges display a percentage. The rate displayed by switch gauges is a MB/second baud rate corresponding to both received and transmitted data on the port. The percentage displayed by hub gauges is a portion of bandwidth corresponding to the port's received data only (the percentage is calculated by the hub's firmware as a port percentage of the loop's total bandwidth).

This performance monitoring feature can be used to determine the bandwidth used on the device's loop. Monitoring the bandwidth usage allows you to make informed decisions about the need to add devices or implement switches for increased throughput.

☞ **NOTE:**
The poll interval for traffic data is five seconds and is not affected by the Softek SANView poll interval set through Softek SANView's Tools menu.

You can set the port traffic threshold (rate or percentage) for triggering the Attention and/or Overload states. Every time this threshold is exceeded, an event is recorded in the SAN Events frame; and the appropriate icon (Attention or Overload) appears in the Historical Traffic Monitor window above, ports that exceed the thresholds. For Vixel Switches, thresholds correlate to the amount of port traffic—the selected point between 0 and 200 MB/second. For Vixel Managed Hubs, thresholds correlate to the percentage of available traffic used by the port—the selected point between 0 and 100 percent. (You can select a single percentage point by pressing an arrow key.)

The **File** menu allows you to close the window or exit the SANView Client.

The **Options** menu allows you to reset traffic threshold settings for either all Vixel Managed Hubs or all Vixel Switches (depending on the window from which the Historical Traffic Monitor window was opened).

The **Tools** menu allows you to change traffic threshold settings for either all Vixel Managed Hubs or all Vixel Switches (depending on the window from which the Historical Traffic Monitor window was opened).

The **Help** menu contains two options: **Contents** for online help display and **About Softek SANView...** for system and version information.

The Historical Traffic Monitor window also offers the following information:

- Traffic display for total of all ports.
- Traffic display for all selected ports.
- For Vixel Managed Hubs, traffic display for all selected zones (by port).
- For Vixel Switches, a separate measure of port receiver and port transmitter traffic (left and right numbers under port graphs, respectively).
- Time Scale by the selected unit (seconds, minutes, or hours).

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- High water mark (the most traffic generated) on a port; displayed when you position your cursor over a port graph.
- Magnified and detached port graph; displayed when you double-click a port graph.

▶ **To record an event every time a traffic threshold is exceeded:**

- Keep the Historical Traffic Monitor window open (minimized is okay). Events are automatically recorded in the SAN Events frame (lower frame in Softek SANView's main window).

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3

Firmware Image Configuration Dialog Box

- The Firmware Image Configuration Dialog Box 13

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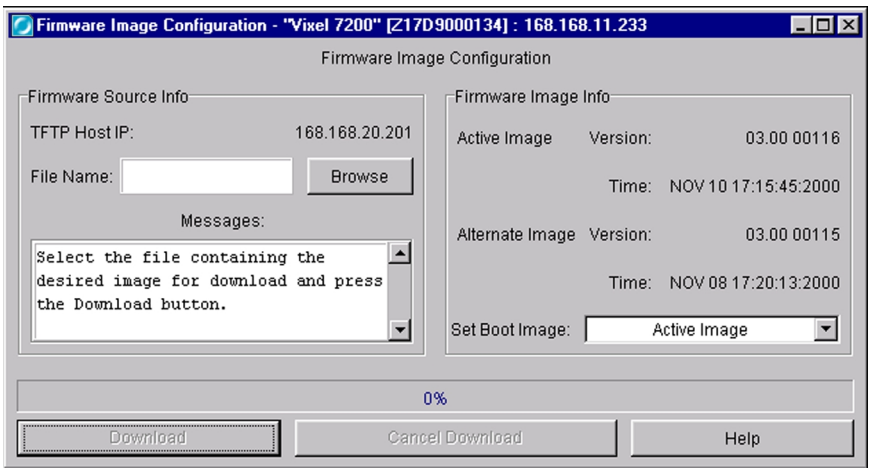
This section describes the selections of Softek SANView's Firmware Image Configuration dialog box as it applies to Vixel devices. This dialog box can be opened from Vixel hub and switch windows through the **Configure firmware image...** option in the Tools menu.

The Firmware Image Configuration Dialog Box

The Firmware Image Configuration dialog box is shown below.

Firmware Image Configuration Dialog Box



☞ **NOTE:**
The device's IP Address (which is listed in the title bar of the dialog box) must be included in either the Domain Name System (DNS) or the host name file on the Softek SANView Server system for file transfer to occur. Host name files are typically located in `C:\WINNT\system32\drivers\etc\Hosts` [Windows] or `/etc/hosts` [UNIX].
To register a managed device, obtain the device's IP Address and device name from the system administrator, open the host name file in an editor (such as Notepad), type the device's IP Address and device name (on one line), and save the file.

The TFTP Host IP (read-only) textbox automatically lists the IP Address of the Softek SANView Server system.

☞ **NOTE:**
For files to be transferred, the TFTP client must initialize correctly on port 69 when the Softek SANView Server is started. Otherwise an error message is displayed when Download is clicked. (TFTP client initialization errors are recorded in the `SIServer.err` file, which is located in *`install_dir`*`/bin`, where *`install_dir`* is the installation directory.)

- The selections in the Firmware Image Configuration dialog box are described below.

Firmware Image Configuration Dialog Box Selections

Selection	***Function***
File Name^	Allows you to enter the path and filename of the desired firmware image file. The combined path and filename are limited to 128 characters, starting from and including the `deviceconf/` directory.
Browse	Allows you to search for the firmware image file within the appropriate vendor directory.
Set Boot Image	Allows you to choose the desired image for activation upon agent reset.
Download	Transfers file (through TFTP) to the device.
Abort Download	Stops the file transfer.
Help	Displays Softek SANView online help.

^ All firmware image files are accessed from the appropriate vendor directory in*:
`(Windows) C:\SANView\SIFileSystemRoot\deviceconf\`
• `(UNIX) /opt/SANView/SIFileSystemRoot/deviceconf/`
*Files are located on the Softek SANView Server system. The listed locations assume that the default installation directory for Softek SANView was accepted and that Softek SANView's Root Directory parameter is unchanged. (By default, Softek SANView's Root Directory is named "SANView" and is placed inside the accepted installation directory.)

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Schedule Tasks Option

- The Zone Scheduler Dialog Box 17

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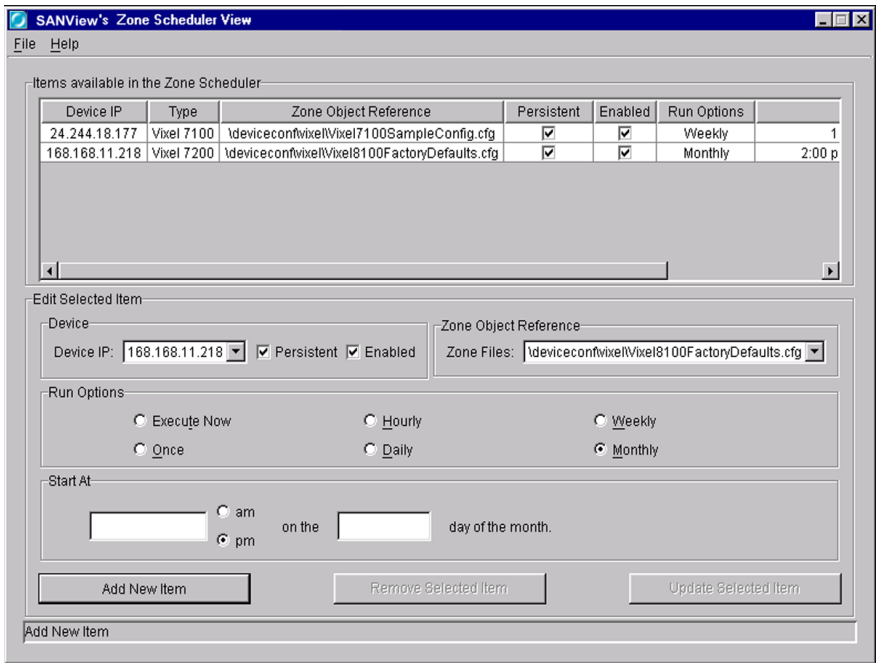
This section describes Softek SANView's Schedule tasks option as it applies to Vixel devices. When the Schedule tasks option and Vixel sub-option are chosen from the Tools menu (Softek SANView's main window), the Zone Scheduler dialog box is displayed, allowing you to schedule zoning configurations for Vixel 2100 Managed Hubs (when the Zoning feature is enabled), Vixel 7100 / 7200 Switches, and Vixel 8100 Fabric Switches.

The Zone Scheduler Dialog Box

Zone Scheduler View Dialog Box



The **File** menu allows you to close the window or exit the Softek SANView Client.

The **Help** menu contains two options: **Contents** for online help display and **About Softek SANView...** for system and version information.

☞ **NOTE:**
To ensure that scheduled zoning and other tasks are executed, base the Scheduler interval on the task with the lowest time measurement. For example, if one task needs to be executed every 60 seconds and the other task needs to be executed every 30 seconds, set the Scheduler interval for 30 seconds. The Scheduler interval is set in the Softek SANView Server Configuration dialog box.

- The selections under Edit Selected Item (bottom area of dialog box) are described below.

Selections Under Edit Selected Item

Selection or Textbox	***Description***
Device IP	Drop-down list of monitored hubs and switches on which zoning is supported.
Persistent	When checked, ensures that the zoning configuration remains when power is cycled to the hub or switch.
Enabled	When checked, allows scheduled zoning to occur at specified time(s).
Zone File^	Drop-down list of available zone configuration files.
Run Options	Determines how often the zoning configuration is applied to the hub or switch.
Start At	Determines the time and day at which the zoning configuration is applied to the hub or switch.
Add New Item	Creates an entry in the “Items Available in the Zone Scheduler” list with the specified settings.
Remove Selected Item	When an entry within the “Items Available in the Zone Scheduler” list is selected, deletes that entry.
Update Selected Item	When an entry within the “Items Available in the Zone Scheduler” list is selected, applies all settings configured within the Edit Selected Item area (bottom half of dialog box).

^ All device configuration files are saved to the appropriate vendor directory in*:

- (Windows) `C:\SANView\SIFileSystemRoot\deviceconf\`
- `(UNIX) /opt/SANView/SIFileSystemRoot/deviceconf/`

*Files are located on the Softek SANView Server system. The listed locations assume that the default installation directory for Softek SANView was accepted and that Softek SANView’s Root Directory parameter is unchanged. (By default, Softek SANView’s Root Directory is named “SANView” and is placed inside the accepted installation directory.)

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Trap Configuration Dialog Box

- The Trap Configuration Dialog Box 21

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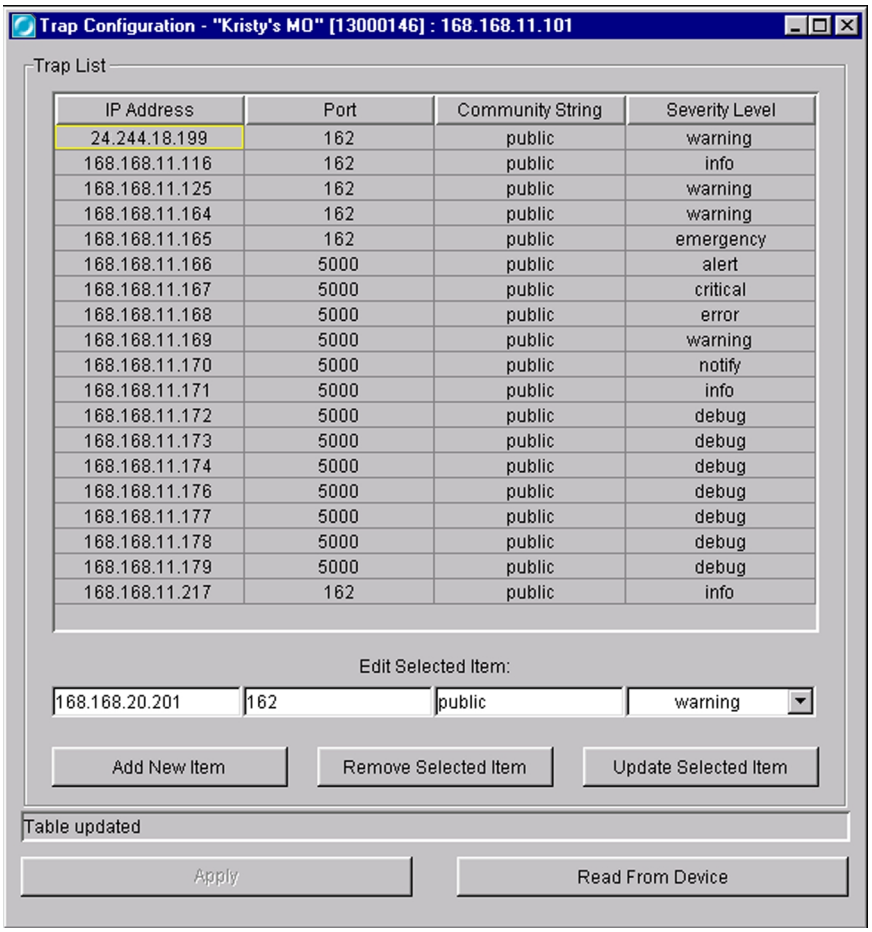
This section describes the selections of Softek SANView's Trap Configuration dialog box, which can be opened from the Vixel hub and switch windows through the **Configure traps...** option in the Tools menu.

☞ **NOTE:**
The trap-listening process requires registration of devices in either the Domain Name System (DNS) or the host name file on the Softek SANView Server system. Host name files are typically located in `C:\WINNT\system32\drivers\etc\Hosts` [Windows] or `/etc/hosts` [UNIX].
To register a managed device, obtain the device's IP Address and device name from the system administrator, open the host name file in an editor (such as Notepad), type the device's IP Address and device name (on one line), and save the file.

The Trap Configuration Dialog Box

The Trap Configuration Dialog Box is shown on the next page.

Trap Configuration Dialog Box



The "Trap List" (upper portion of the dialog box) lists an entry for each configured trap destination. The "Trap List" columns are defined below.

Trap List

Trap List column	***Definition***
IP Address	IP Address of the destination system.
Port	Port of the destination system that is configured to listen for traps.
Community String	Password, if applicable.
Severity Level	The type of event messages that you want to trigger traps. For example, selection of the "alert" severity level configures traps to be sent only when event messages of the "alert" severity or higher occur. (Severity level configuration is not available for Vixel 8100.)

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The textboxes under Edit Selected Item (bottom area of dialog box) match the columns of the above Trap List.

- The selections under Edit Select Item are described below.

Selections Under Edit Select Item

Selection	***Description***
Add New Item	Adds the entered information to the Trap List as an entry.
Remove Selected Item	Deletes the selected entry.
Update Selected Item	Changes the selected entry with the entered information.
Apply	Saves the trap configurations onto the agent.
Discard	Cancels any trap configurations made since the Trap Configuration dialog box opened.
Help	Displays Softek SANView online help.

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Manage Licenses Dialog Box

- The Manage Licenses Dialog Box 27

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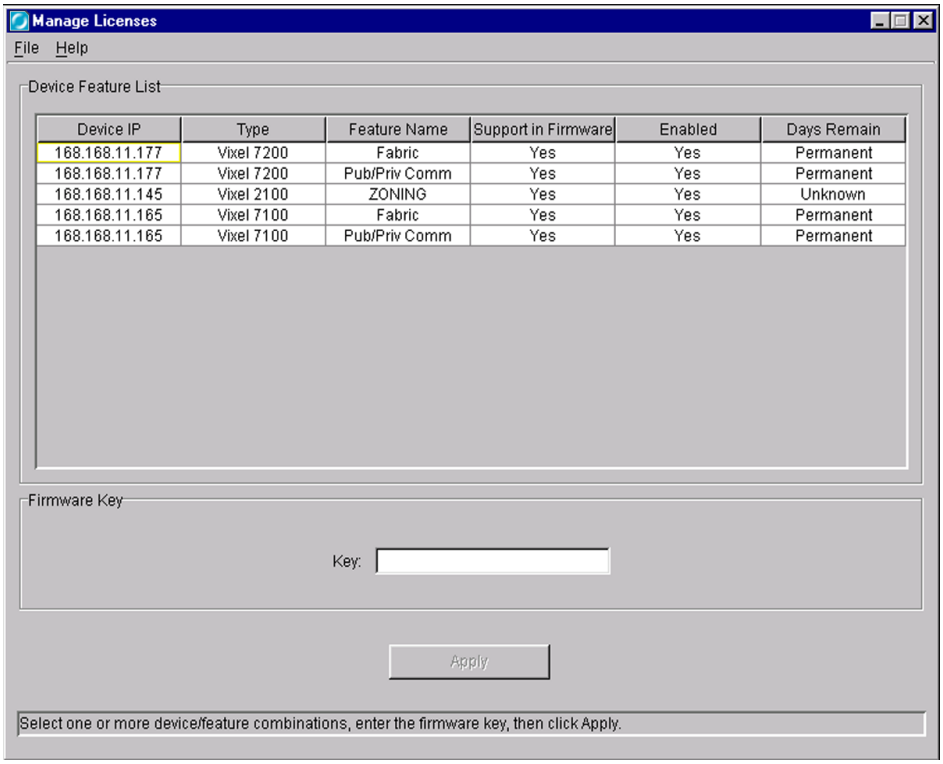
This section describes Softek SANView's Manage Licenses dialog box as it applies to Vixel devices. This dialog box is opened through the **Manage Licenses** option (under the Vixel sub-option) in the **Tools** menu of Softek SANView's main window.

The Manage Licenses Dialog Box

When the Vixel module is chosen, the Manage Licenses dialog box is displayed, which allows you to enable purchased features such as hard zoning.

Manage Licenses Dialog Box


Manage Licenses
File Help
Device Feature List
Device IP
Type
Feature Name
Support in Firmware
Enabled
Days Remain
168.168.11.177 Vixel 7200 Fabric Yes Yes Permanent
168.168.11.177 Vixel 7200 Pub/Priv Comm Yes Yes Permanent
168.168.11.145 Vixel 2100 ZONING Yes Yes Unknown
168.168.11.165 Vixel 7100 Fabric Yes Yes Permanent
168.168.11.165 Vixel 7100 Pub/Priv Comm Yes Yes Permanent
Firmware Key
Key:
Apply
Select one or more device/feature combinations, enter the firmware key, then click Apply.

The **File** menu allows you to close the window or exit the Softek SANView Client.

The **Help** menu contains two options: **Contents** for online help display and **About Softek SANView...** for system and version information.

The **Device Feature** list (upper portion of the dialog box) lists an entry for each detected Vixel device that has separate feature options. The columns in the **Device Feature** list are defined below.

Device Feature List

Device Feature column	***Definition***
Device IP	IP Address of the detected Vixel device.

Device Feature List

Device Feature column	***Definition***
Type	Vixel device name (for example, “Vixel 7200").
Feature Name	Specific feature that can be enabled on this device.
Support in Firmware	Indicates whether said feature is supported in the current firmware.
Enabled	Indicates whether said feature is enabled. (When a valid license key is entered and the Manage Licenses dialog box refreshes, a checkmark appears to indicate that the feature is enabled.)
Days Remain	Number of days remaining on this enabled feature.

The **Key** textbox is used for entering the purchased license key for the selected entry or entries.

The **Apply** button is used to save the entered license key so that the feature is enabled.

■ ■

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Switch Window

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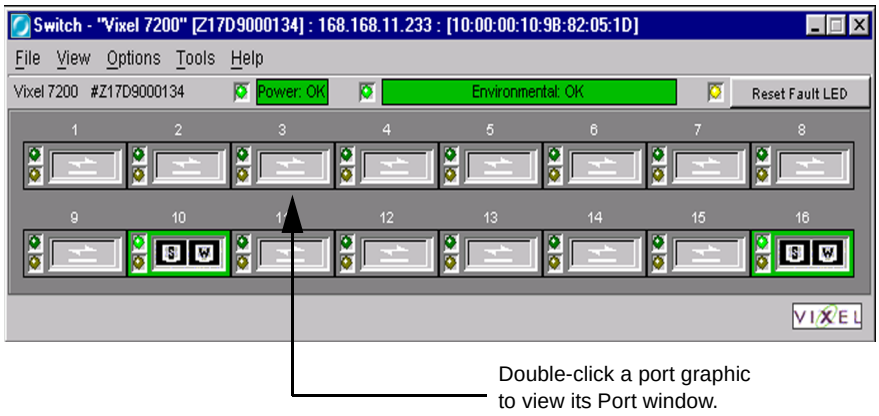
Overview

This section describes the functions and selections of Softek SANView's switch window for Vixel Switches. Each dialog box and window is referred to by the name that appears in its title bar.

The Switch window identifies each port of the switch, the types of modules installed (when applicable), and the health of the switch ports and internal hardware (enclosures).

☞ **NOTE**:
The switch Ethernet Mode is changed through the Configure Agent dialog box, which can be opened by right-clicking the related agent in the SANView Client's Tree frame.

Switch Window for a Vixel 7200 Fibre Channel Switch


Switch - "Vixel 7200" [Z17D9000134] : 168.168.11.233 : [10:00:00:10:9B:82:05:1D]
File View Options Tools Help
Vixel 7200 #Z17D9000134
Power: OK
Environmental: OK
Reset Fault LED
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
VIXEL
Double-click a port graphic
to view its Port window.

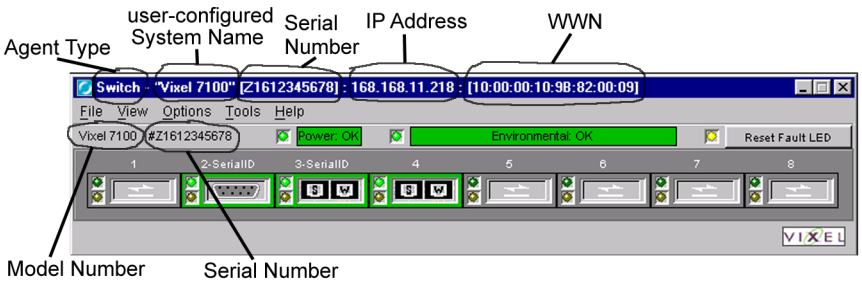
▶ To open the Switch window

- Double-click the desired switch icon in the main window.

Title Bar, LED Row, and Icons

The title bar of the Switch window lists (from left to right): Agent Type (Switch), System Name in quotes (user-configured), Serial Number in brackets, IP Address, and World-wide Name (WWN). The LED row under the menus lists (from left to right): Model Number, Serial Number, Power LED, Environmental LED, and Reset Fault LED.

Switch window for a Vixel 7100, with explanatory call-outs for title bar and LED row



The LED color legend is described below.

LED Color Legend of the Switch Window

Switch LED	Green	Yellow
Power	OK	N/A—switch will not display if powered off.
Environmental	OK	• Fan fault—fan(s) have stopped operating. • Over temperature warning or fault.
Reset Fault	N/A	• Internal switch failure—an internal failure was detected. • Self-test failure—POST failed and the system needs attention. • Incorrect configuration loaded.

Port LED of the Switch Window

Port LED	On	Off
Green (top)	The inserted module is healthy (normal operation).	Either there is no module inserted, or the module is unhealthy.
Yellow (bottom)	The port is bypassed due to a problem detected by either the module's transmit logic or the module receiver. Receiver problems include unconnected fiber, remote node not transmitting, LIP(F8), or a faulty module receiver.	The port is not bypassed. (normal operation)

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The module icons (for SFPs and GBICs) are described below.

Module Icons for SFPs and GBICs

Module Icon	Module Type
	Intra Copper
	Inter Copper
	• FC LW Laser (Longwave) • Serial FC LW Laser (Longwave)
	• FC SW Laser (Shortwave) • Serial FC SW Laser (Shortwave)
	• DB-9 Serial Intra Copper • DB-9 Serial Inter Copper
	• HSSDC Serial Intra Copper • HSSDC Serial Inter Copper
	• GBIC Unknown • No Module

File Menu

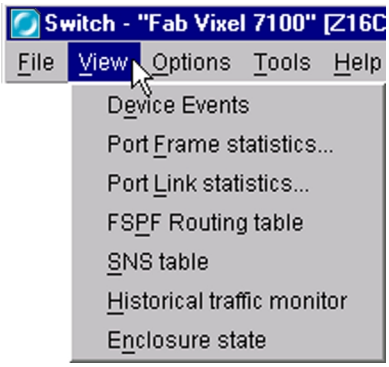
The **File** menu allows you to close the window or exit the SANView Client.

File Menu of the Switch Window

View Menu

The **View** menu has the options shown below.

View menu (Switch Window), for a Vixel 7100 running V. 3.0 firmware (FSPF Routing table used)



Device Events lists the event messages read from the selected switch.

Port Frame statistics... counts frames (such as "C2Discards") for each port.

Port Link statistics... counts occurrences of certain events or signals for each port.

FSPF Routing table or **RIP table** characterizes paths to other switches and lists the domain numbers of the destination switches.

☞ **NOTE**:
The available option (FSPF or RIP) is determined by the switch routing protocol, which depends on switch model and firmware version. Some switches use FSPF while others use RIP. Vixel 9000 Series Switches use FSPF only.

SNS table displays information for devices that are registered with the switch

Historical traffic monitor measures the traffic on the switch.

Enclosure state displays the current status of the switch fans, airflow, temperature, power supply, and battery.

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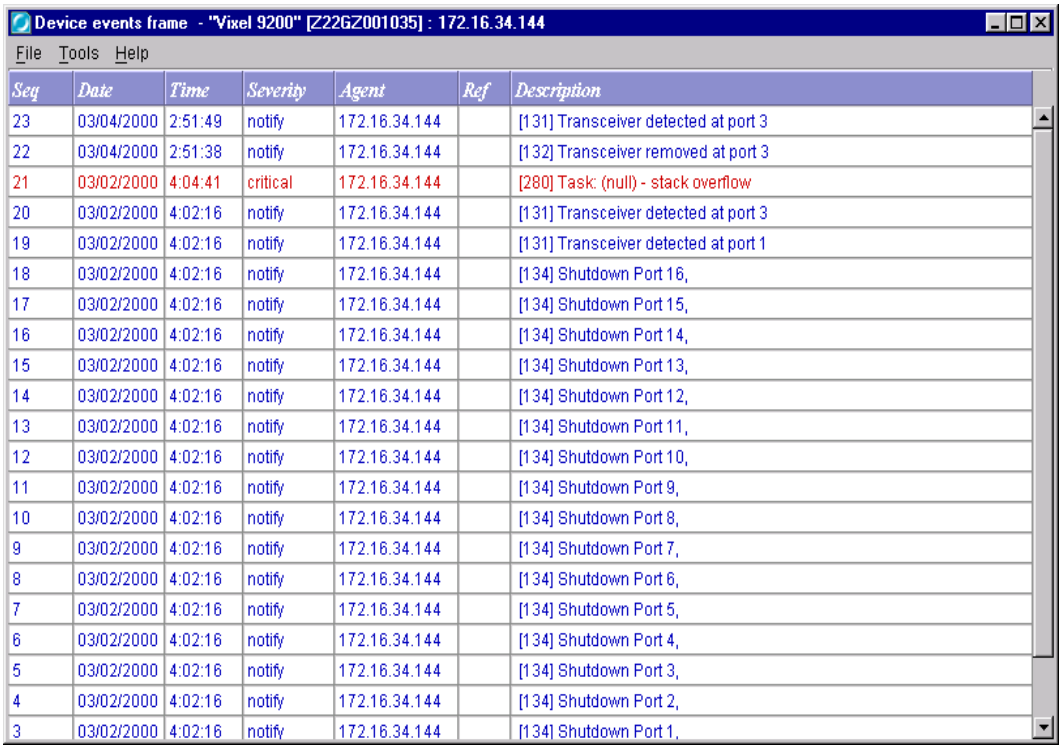
Device Events

Displays the Device Events window for the switch, as shown below.

Device Events Window



Seq	Date	Time	Severity	Agent	Ref	Description
23	03/04/2000	2:51:49	notify	172.16.34.144		[131] Transceiver detected at port 3
22	03/04/2000	2:51:38	notify	172.16.34.144		[132] Transceiver removed at port 3
21	03/02/2000	4:04:41	critical	172.16.34.144		[280] Task: (null) - stack overflow
20	03/02/2000	4:02:16	notify	172.16.34.144		[131] Transceiver detected at port 3
19	03/02/2000	4:02:16	notify	172.16.34.144		[131] Transceiver detected at port 1
18	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 16,
17	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 15,
16	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 14,
15	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 13,
14	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 12,
13	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 11,
12	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 10,
11	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 9,
10	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 8,
9	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 7,
8	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 6,
7	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 5,
6	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 4,
5	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 3,
4	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 2,
3	03/02/2000	4:02:16	notify	172.16.34.144		[134] Shutdown Port 1,

☞ **NOTE**:
Network drives can be accessed only if they are mapped to a drive letter. In file names, avoid the following characters (separated by commas): \, /, :, *, ?, “, <, >, {, }, [,], (,), |.

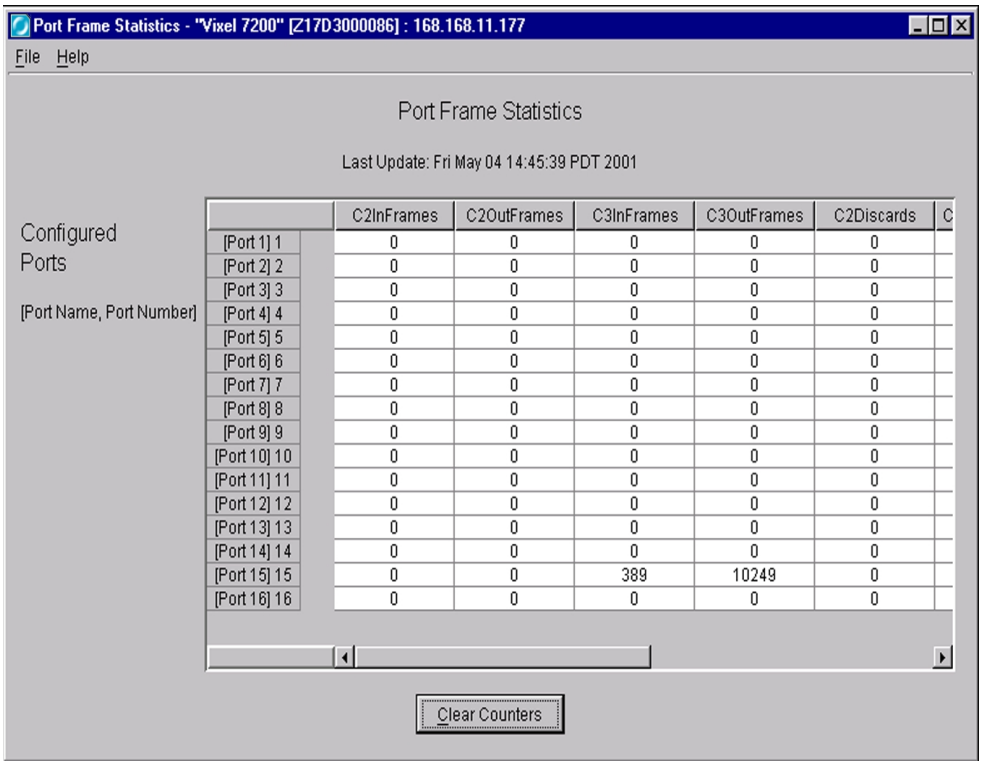
Port Frame Statistics

Displays the Port Frame Statistics dialog box (shown below). You can save this information to a file (see the File menu). To clear the counters on the switch, click **Clear Counters**. To see more columns, move the scrollbar or resize the window.

▶ **To reorder columns:**

- Click and hold the left mouse button on the desired column and drag to the desired location.

Port Frame Statistics Window


Port Frame Statistics - "Vixel 7200" [Z17D3000086] : 168.168.11.177
File Help
Port Frame Statistics
Last Update: Fri May 04 14:45:39 PDT 2001
Configured Ports
[Port Name, Port Number]
C2InFrames C2OutFrames C3InFrames C3OutFrames C2Discards
[Port 1] 1 0 0 0 0 0
[Port 2] 2 0 0 0 0 0
[Port 3] 3 0 0 0 0 0
[Port 4] 4 0 0 0 0 0
[Port 5] 5 0 0 0 0 0
[Port 6] 6 0 0 0 0 0
[Port 7] 7 0 0 0 0 0
[Port 8] 8 0 0 0 0 0
[Port 9] 9 0 0 0 0 0
[Port 10] 10 0 0 0 0 0
[Port 11] 11 0 0 0 0 0
[Port 12] 12 0 0 0 0 0
[Port 13] 13 0 0 0 0 0
[Port 14] 14 0 0 0 0 0
[Port 15] 15 0 0 389 10249 0
[Port 16] 16 0 0 0 0 0
Clear Counters

Port Frame Statistics columns are listed in order of display and described below.

Port Frame Statistics Columns

Port Frame Statistic	Occurrences Being Counted
C2InFrames	Class 2 frames received by this port.
C2OutFrames	Class 2 frames leaving by this port.
C3InFrames	Class 3 frames received by this port.
C3OutFrames	Class 2 frames leaving by this port.
C2Discards	Class 2 frames thrown out by this port.

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Port Frame Statistics Columns

Port Frame Statistic	Occurrences Being Counted
C2FbsyFrames	Class 2 frames thrown out by this port because this port already has an established communication with another port (it's busy).
C2FrjtFrames	Class 2 frames rejected by this port. Frames are usually rejected because they did not pass the frame validation inspections inherent in Fibre Channel protocol.
GenlStatRxABTS	ABTS commands received by this port.
GenlStatRxFCPcmds	Fibre Channel Protocol (FCP) commands received by this port.

☞ **NOTE**:
To minimize SNMP traffic, the Port Link Statistics window displays data for ports with inserted modules only.

Port Link Statistics

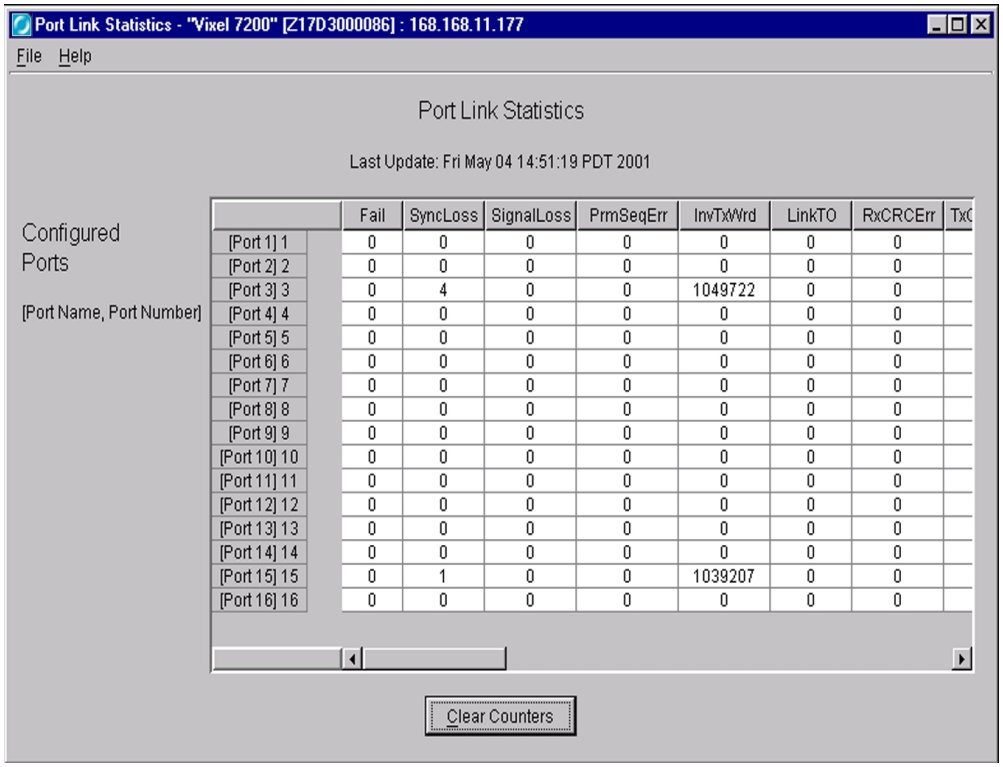
Displays the Port Link Statistics dialog box (see *Port Link Statistics Window* on page 38). This dialog box counts occurrences of certain events or signals for each port. To clear the counters on the switch, click **Clear Counters**. You can save this information to a file (see the **File** menu). The saved file contains caption, timestamp, column headers, and all counter data in comma-separated values with an Append file attribute (on demand). To see more columns, move the scrollbar or resize the window.

☞ **NOTE**:
Network drives can be accessed only if they are mapped to a drive letter. In file names, avoid the following characters (separated by commas): \, /, :, *, ?, “, <, >, {, }, [,], (,), |.

▶ **To reorder columns:**

- Click and hold the left mouse button on the specified column and drag to the desired location.

Port Link Statistics Window


Port Link Statistics - "Vixel 7200" [Z17D3000086] : 168.168.11.177
File Help
Port Link Statistics
Last Update: Fri May 04 14:51:19 PDT 2001
Configured Ports
[Port Name, Port Number]
Clear Counters

	Fail	SyncLoss	SignalLoss	PrmSeqErr	InvTxWrd	LinkTO	RxCRCErr	TxC
[Port 1] 1	0	0	0	0	0	0	0	
[Port 2] 2	0	0	0	0	0	0	0	
[Port 3] 3	0	4	0	0	1049722	0	0	
[Port 4] 4	0	0	0	0	0	0	0	
[Port 5] 5	0	0	0	0	0	0	0	
[Port 6] 6	0	0	0	0	0	0	0	
[Port 7] 7	0	0	0	0	0	0	0	
[Port 8] 8	0	0	0	0	0	0	0	
[Port 9] 9	0	0	0	0	0	0	0	
[Port 10] 10	0	0	0	0	0	0	0	
[Port 11] 11	0	0	0	0	0	0	0	
[Port 12] 12	0	0	0	0	0	0	0	
[Port 13] 13	0	0	0	0	0	0	0	
[Port 14] 14	0	0	0	0	0	0	0	
[Port 15] 15	0	1	0	0	1039207	0	0	
[Port 16] 16	0	0	0	0	0	0	0	

The Port Link Statistics columns are listed in alphabetical order and described in the following table.

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Port Link Statistics Columns

Port Link Statistics Columns	Occurrences being Counted	Notes
ActDev	Devices that this port has discovered during loop initialization.	---
Failure	Link failure events.	N_Port State machine signaling remote has disconnected or has not responded in time, indicating a problem with the remote device. This counter is a long-term event counter, incrementing only once even if the condition persists. A link failure event occurs when one of the following events occurs: • A loss of synchronization. • Link reset protocol. • A Not Operational (NOS) primitive sequence is received. • A loss of signal occurs in an illegal state.
InvTxWord	Instances of link corruption.	Causes of link corruption follow: • code violation (invalid transmit word). • framing error. • improper beginning running disparity.
LinkTo	Expiration of the protocol timer E_D_TOV during protocol state change on the line.	A switch port's timer may expire if it is much faster than the remote device. To resolve this speed discrepancy, either increase the remote device's speed or increase the switch time-out period (change the EDTOV setting through the Ports tab of the Configure Switch dialog box).
LoopConnTO	Loop Connection Time Out.	This counter increments when remote devices do not acknowledge protocol within the configured time limit. Time-outs indicate a need to increase the remote device's speed. Frequent time-out will definitely affect performance.
PrimSeqErr	Detected primitive sequence errors received.	Primitive sequence errors indicate that the remote device is violating protocol. In most cases the switch port discards the primitive. If the attached device has done its homework, this counter increments very rarely.
PRLIResp	Devices on this port that responded to the PRLI probe for FC4 Types.	---
RxClkLoss	Loss of receive clock.	The switch does not lose receive clock. (This hardware signal was designed to have an external sync indicator in a future release.)

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Port Link Statistics Columns

Port Link Statistics Columns	Occurrences being Counted	Notes
RxCrcErr	Receipt of CRC errors.	Receipt of CRC errors can be caused by the following conditions: • Internal problems on a remote device. • Link data corruption caused by a generous number of InvTxWords on the same line. • Bad cabling or other electromagnetic interference.
RxFIFOOverRun	Receipt of more data than FIFO has room for.	Contact an authorized service representative if FIFO errors occur. Any FIFO problem must be attended to immediately. Internal adjustment will be necessary to correct this indication.
RxFrameTooLong	Receipt of a frame longer than the set maximum.	This occurrence can be caused by a discrepancy in maximum settings; the switch setting for maximum frames may be smaller than the device setting. In this case, the counter increments in large bursts as full device frames are sent. Note that not all frames are full frames. For example, command type frames are usually much smaller than full frames. Device discovery may complete and appear to work until large frames are passed.
RxFrameTooShort	Receipt of a truncated short frame.	Truncated short frames should occur infrequently. Possible causes follow: • Protocol reset. • Remote device failure. • Extreme noise or external disruption (unlikely).
RxLinkResets	Receipt of N_Port LR primitives.	A device has sent N_Port LR primitives to the switch, indicating that protocol errors are occurring. This is a Switch to device peer level indicating some type of recovery needed. If frequent resets occur, then a possible credit mismatch may be a cause. Link failure is also recorded in message logs, as well as Trap if set up. For cascade switch ports in one of the Stealth Modes, a N_Port LR primitive indicates that a target device has passed a LIP (Loop Initialization Primitive) propagation to initiator device(s); that is, the LIP If Storage Added option (in Softek SAN-View) was enabled.
RxMissingDelims	Received FIFO data has a frame that is not properly delimited by SOF or EOF.	Missing delimiters in received FIFO data can be caused by the following conditions: • Recover event to a very slow or delinquent remote device (most common). • A Rcv FIFO overrun. • Internal corruption or faulty firmware (least common).

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Port Link Statistics Columns

Port Link Statistics Columns	Occurrences being Counted	Notes
RxOls	Receipt of N_Port OLS.	A received N_Port OLS indicates that a connected device went into an Off-Line state—that is, although the device is still powered on, it is not operational because the upper level needs recovery time before data can be transmitted or received. Frequent OLS states indicate that the devices were able to establish connection. Then, loose connection long enough for protocol reset to also fail. This should be an infrequent event unless connections are being disrupted at the protocol level. Note: Received N_Port OLS primitives invoke the Registered State Change Notification, which prompts hosts to update their device information through the switch SNS table (see "SNS Table" on page 48).
RxOpenCLS	Receipt of a CLS by the port OPN.	The remote device on the loop is generating a CLS to the port OPN. This indicates that a device is not allowing the port to send data to it. If the counter increases, attempts to send data out the port are affected and performance begins to lower.
SelfReg	Public devices on this port that automatically registered with the Directory Server and indicated their FC4 type.	---
SignalLoss	Loss of signal.	The loss of signal indicates it is unable to find and follow the Rx Clock. The switch port will constantly attempt to find the Rx clock with the assist of the Firmware code. If the counter is changing frequently, this may indicate that the device attached clock or our reference clock is not stable. When initially connected, a few Signal loss may be indicated as a wiggling cable insertion will be in and out of alignment for a few seconds.
SyncLoss	Transitions of the physical level from a synchronization-acquired state to a loss of synchronization state.	The switch port is unable to find ordered sets. Until Signal is found, this counter will not change. Sync loss can occur if the data still follows Disparity but does not send Ordered sets. This is very rare and will most likely follow the Signal Loss of Link Failure.
TxCLSOpen	Transmission of a CLS (close) after receiving an OPN (open).	This counter increments when the port does not allow the remote device to send data to it, indicating that the Rx FIFO is full or busy. Frames in the queue are being held due to a destination device not servicing frames. Frames then back up in the destination port Tx queue until it does not allow the router to send more; then the frames begin to back up in the RX queue FIFO changing the CLS to an OPN. This is a good indicator that a slow servicing device may need tuning of data IO request size or Framing Size.

Port Link Statistics Columns

Port Link Statistics Columns	Occurrences being Counted	Notes
TxCrcErr	Transmission of CRC errors.	Switch-wide, the amount of transmitted CRC errors usually equals the amount of received CRC errors. If the switch (that is, the sum of all ports) has transmitted more CRC errors than it has received, the module or switch may have an internal problem. To find out whether the module is causing the problem, isolate the problem to a port, then to the module. To find out whether the switch has an internal problem, check for the following conditions: • Voltage problems or noise on A/C power. • Non-optimum temperature (see the fans). If the switch has an internal problem, contact an authorized service representative.
TxFIFOUnderRun	Transmission of less data than FIFO expected.	Contact an authorized service representative if FIFO errors occur. Any FIFO problem must be attended to immediately. Internal adjustment will be necessary to correct this indication.
TxLinkResets	Transmission of N_Port LR primitives.	A switch has sent N_Port LR primitives to the connected device(s), indicating that protocol errors are occurring. This is a Switch to device peer level indicating some type of recovery needed. If frequent resets occur, then a possible credit mismatch may be the cause. Link failure is also recorded in message logs, as well as Traps, if set up.
TxMissingDelims	Transmitted FIFO data has a frame that is not properly delimited by SOF or EOF.	Missing delimiters in transmitted FIFO data can be caused by the following conditions: • Recover event to a very slow or delinquent remote device (most common). • Frames being aborted and truncated because they get stuck during a route recover. (Some route recovers use a frame Disconnect time-out event that can generate a missing Tx delimiter.) If this happens frequently, the port and system performance is affected. • Internal corruption or faulty firmware (least common).

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Port Link Statistics Columns

Port Link Statistics Columns	Occurrences being Counted	Notes
TxOls	Transmission of N_Port OLS.	A transmitted N_Port OLS indicates that the switch went into an Off-Line state—that is, although the switch is still powered on, it is not operational because the upper level needs recovery time before data can be transmitted or received. Frequent OLS states indicate that the devices were able to establish connection. Then, loose connection long enough for protocol reset also fail. This should be an infrequent event unless connections are being disrupted at the protocol level.
TxParityErr	Parity error on the switch port.	Any Parity must be reported and corrected immediately. This parity error has the following indications: • The switch port is receiving Data over the internal bus with invalid Parity. • The internal hardware may have failed.
TxTagErr	Bad tag.	This is an indication that the switch port is receiving Data over the internal bus with bad Tags. The Bad Tag can be caused by incoming corrupted Frames, which is indicated by an Invalid Tag marker. Much link Parity, a tag is associated to each word in the frame. An internal hardware error of the Tag bits is highly unlikely but still possible. Look for other ports with link problems that might cause Frames to be forward with bad tag to another port.

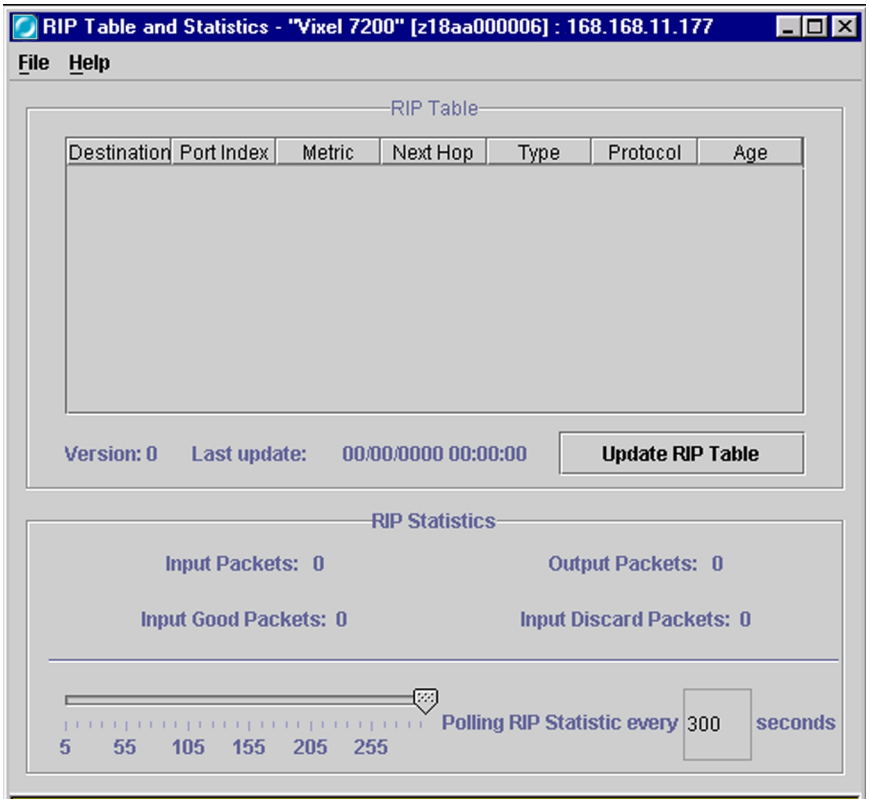
☞ **NOTE**:
Network drives can be accessed only if they are mapped to a drive letter. In file names, avoid the following characters (separated by commas): \, /, :, *, ?, “, <, >, {, }, [,], (,), |.

RIP Table

Displays the RIP Table and Statistics window (shown below). Availability of this window depends on the switch model and firmware version. The switch must be running Fabric Mode and Fabric (Public / Private) Mode.

This window identifies the other switches that the switch can communicate with, and characterizes the communication paths. You can save this information to a file (see the **File** menu).

RIP Table and Statistics Window



The columns in the RIP Table and Statistics window are listed in order of display and are described in the table below.

Note that the selected switch is identified in the title bar of the RIP Table and Statistics window; each destination switch is identified in the Destination column (by its domain or fabric address, represented by the first two characters).

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RIP Table Columns

RIP Columns	Description
Destination	A destination switch (identified by its domain or fabric address) that can communicate with the selected switch (identified in the title bar of the RIP Table and Statistics window). Note: Only the first two characters contain address information.
Port Index	The port in the selected switch that can communicate with the destination switch (identified in the Destination column). Note: A “0” (zero) entry represents the selected switch.
Metric	Number of switches that the selected switch must go through to communicate with the destination switch (identified in the Destination column).
Next Hop	The next switch (identified in this column by its domain or fabric address) that the selected switch must go through to communicate with the destination switch (identified in the Destination column). Note: Only the first two characters contain address information.
Type	The communication path that the selected switch uses to reach the destination switch. Communication paths are identified as follows. • **1 = Other:** the route is through the selected switch only • **2 = Invalid:** the route is not valid • **3 = Direct:** the route is through a directly connected switch domain in the same fabric region • **4 = Indirect:** route to a non-local connected switch domain in the same fabric region
Protocol	The protocol that found the communication path identified in the Type column. Protocols are identified as follows. • **1 = Other:** none of the following protocols • **2 = Local:** Fibre Channel protocol • **3 = NetMgmt:** network management protocol • **4 = RIP:** Routing Information Protocol (RIP)
Age	Number of seconds since this line has been added to or updated in the RIP table. **Note**: RIP updates every 30 seconds; other protocols do not update.

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RIP Statistics

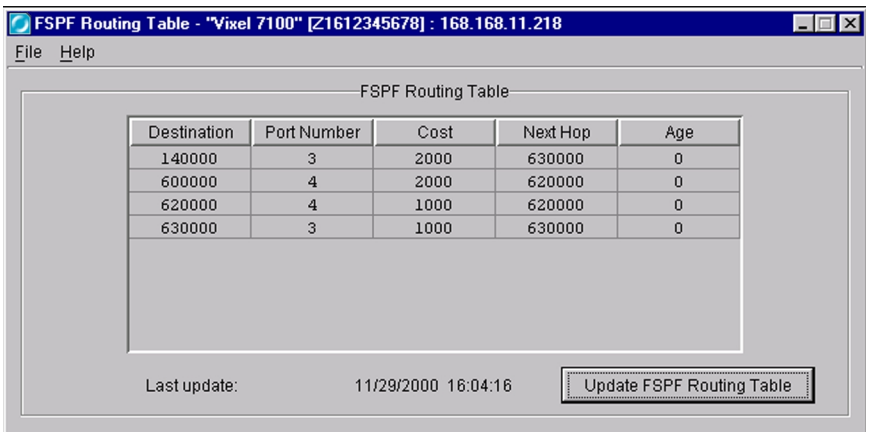
RIP Statistic	Description
Input Packets	Number of RIP packets received.
Output Packets	Number of RIP packets sent out.
Input Good Packets	Number of good RIP packets received.
Input Discard Packets	Number of discarded RIP packets received.
Polling interval	Determines the length of time between polls. The polling interval can be set to any length of time between 5 and 305 seconds.

☞ **NOTE**:
Network drives can be accessed only if they are mapped to a drive letter. In file names, avoid the following characters (separated by commas): \, /, :, *, ?, “, <, >, {, }, [,], (,), |.

FSPF Table

Displays the FSPF Routing Table window (shown below). Availability of this window depends on the switch model and firmware version. The switch must be running Fabric Mode and Fabric (Public/Private) Mode. This window identifies the other switches that the switch can communicate with and characterizes the communication paths. You can save this information to a file (see the **File** menu).

FSPF Routing Table Window


FSPF Routing Table - "Vixel 7100" [Z1612345678] : 168.168.11.218
File Help
FSPF Routing Table
Destination Port Number Cost Next Hop Age
140000 3 2000 630000 0
600000 4 2000 620000 0
620000 4 1000 620000 0
630000 3 1000 630000 0
Last update: 11/29/2000 16:04:16
Update FSPF Routing Table

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The columns in the FSPF Routing Table window are listed in order of display and are described in the table below. Note that the selected switch is identified in the title bar of the FSPF Routing Table window; each destination switch is identified in the Destination column (by its domain or fabric address, represented by the first two characters).

FSPF Table Columns

FSPF Columns	Description
Destination	A destination switch (identified by its domain or fabric address) that can communicate with the selected switch (identified in the title bar of the FSPF Routing Table window). Note: Only the first two characters contain address information.
Port Number	The port in the selected switch that can communicate with the destination switch (identified in the Destination column). Note: An entry of "0" (zero) entry represents the table entry for the selected switch.
Cost	Burden of this path to the destination switch. Cost is typically related to the number of switches that the selected switch must go through to communicate with the destination switch. Frames are routed via the path with the lowest cost, or "lightest burden." (Cost = *S* * (1.0625e12 / link speed in bits per second) where *S* is an administratively defined factor. For more information, see the OSRP specification at the T11 website.)
Next Hop	The next switch (identified in this column by its domain or fabric address) that the selected switch must go through to communicate with the destination switch. Note: Only the first two characters contain address information.
Age	Number of seconds since this line has been added to or updated in the FSPF Routing Table.

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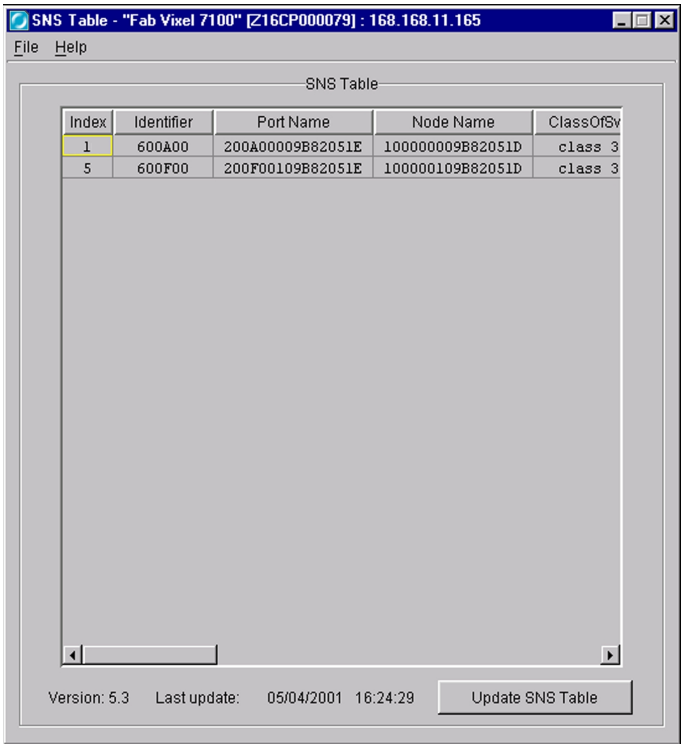
SNS Table

Displays the SNS Table (available for Fabric Mode and Fabric (Public / Private) Mode)(shown below). This window displays information for devices that are registered with the switch. Devices that automatically send registration to SNS (Simple Name Server) include hosts and drives. You can save this information to a file (see the **File** menu).

SNS Table Window


SNS Table - "Fab Vixel 7100" [Z16CP000079] : 168.168.11.165
File Help
SNS Table
Index Identifier Port Name Node Name ClassOfSv
1 600A00 200A00009B82051E 100000009B82051D class 3
5 600F00 200F00109B82051E 100000109B82051D class 3
Version: 5.3 Last update: 05/04/2001 16:24:29
Update SNS Table

☞ **NOTE**:
Devices on communication-disabled ports ("Denied" ports in the Zoning Configuration Table window) may appear in the SNS table even though the port-based zoning is supported.

Each device is identified in the **NodeName** column; the device port is identified in the **PortName** column. The switch port to which the device is connected is identified in two columns: the **Index** column (as the port number) and the **Identifier** column (as its Fibre Channel address). To find out whether a device in this window supports SCSI-FCP, see the **SCSI-FCP** column, which is the last column on the right—move the bottom scroll bar.

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The columns in the SNS Table window are listed in order of display and described in the table below.

SNS Table Columns

SNS Columns	Description
Index	Number of switch port to which this device is connected.
Identifier	Fibre Channel (three-byte) address identifying the location of the switch-device connection. Each character represents a half byte, or four bits. The first and second characters identify the switch (Domain) while the third and fourth characters identify the switch port (Area).
PortName	Name of this connected device's port; uniquely identifies the port on the device.
NodeName	Name of this connected device; uniquely identifies the device.
ClassOfSvc	The classes of service supported by this connected device (1, 2, 3, F). Note: Vixel 8100 Fabric Switches support classes 2 and 3 only.
NodeIPAddress	The node's IPv6 formatted address for this connected device.
ProcAssoc	Process Associator for this connected device.
FC4Type	FC-4 types supported by this connected device (displayed as 32 characters in hex format). SCSI-FCP support is specified in the SCSI-FCP column. To find out whether another FC-4 type is supported, follow the instructions below this table to perform an AND operation with the type's mask and the appropriate word (eight-character set) in the 32-character FC4Type value. The type is supported if the result is a value other than zero.
Type	Port type for this connected device.
IPAddress	IPv6 formatted address of this connected device.
FabricPortName	Name of the fabric port for this connected device.
HardAddress	Hard address for this connected device.
SCSI-FCP	Specifies whether this connected device supports SCSI-FCP ("Yes" or "No").

Historical Traffic Monitor

Displays the Historical Traffic Monitor window shown below.

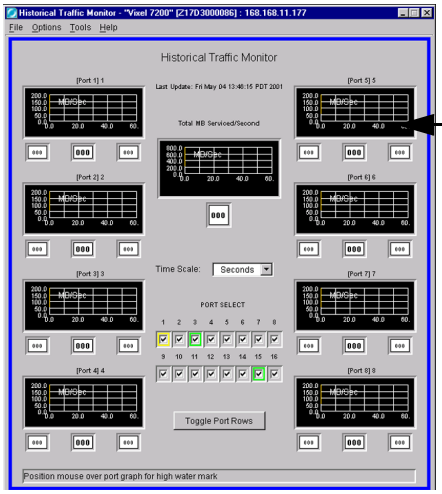
☞ **NOTE**:
Only frame data is measured; LIPs, ARBs, and IDLEs are ignored.

The port gauges on the Historical Traffic Monitor window display a a MB/second baud rate corresponding to both received and transmitted data on the port.

This performance monitoring feature can be used to determine the bandwidth used on the device. Monitoring the bandwidth usage allows you to make informed decisions about the need to add devices or implement switches for increased throughput.

For information about configuration settings, see *The Historical Traffic Monitor Window* on page 7.

Historical Traffic Monitor Window


Historical Traffic Monitor - "Vixel 7200" [217D3000086] : 168.168.11.177
File Options Tools Help
Historical Traffic Monitor
Total MB Serviced/Second
Time Scale:
Seconds
PORT SELECT
Toggle Port Rows
Position mouse over port graph for high water mark

Click the desired port graph to magnify its size in a separate window, or position your mouse pointer over the desired port graph to view its high water marks.

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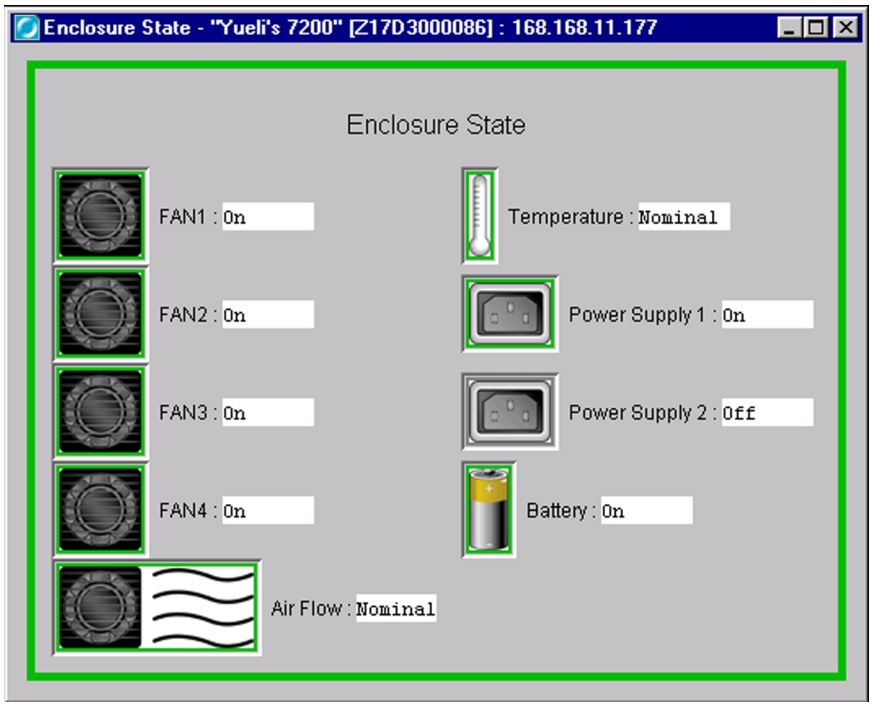
Enclosure State

Displays the current status of the switch fans, airflow, temperature, power supply, and battery in the Enclosure State window shown below.

Enclosure State Window



For Vixel 9000 Series Switches (switches with redundant power supplies), the possible values for the "Power Supply 1" and "Power Supply 2" fields are as follows:

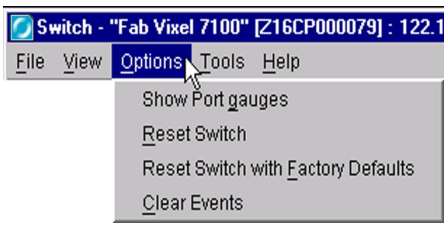
- On (green)
- Off (yellow)
- Absent (gray).

A value of Off means that the power supply is either not plugged in or not operational.

Options Menu

The **Options** menu has the options shown below.

Options menu for a Vixel 7100 Switch window


Switch - "Fab Vixel 7100" [Z16CP000079] : 122.1
File View Options Tools Help
Show Port gauges
Reset Switch
Reset Switch with Factory Defaults
Clear Events

Show Port gauges allows you to show or hide the port gauges under each port to display traffic rates. For more information on traffic rates, see *The Historical Traffic Monitor Window* on page 7.

Activate backup fan (Vixel 8100 only) turns on the backup fan.

Reset Switch allows you to execute a soft reset of the switch.

Reset Switch with Factory Defaults (not available for Vixel 8100) allows you to apply the factory default (as-shipped) switch configuration settings and execute a soft reset of the switch.

☞ **NOTE**:
Selecting this option will not impact the existing switch IP Address settings.

Clear Events deletes all event messages that are stored on the switch (note that the switch continues to generate event messages).

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Tools Menu

The **Tools** menu has the options shown below.

Tools menu for a Vixel 9100 Switch window

Poll now immediately polls the switch for information instead of waiting for the next poll interval.

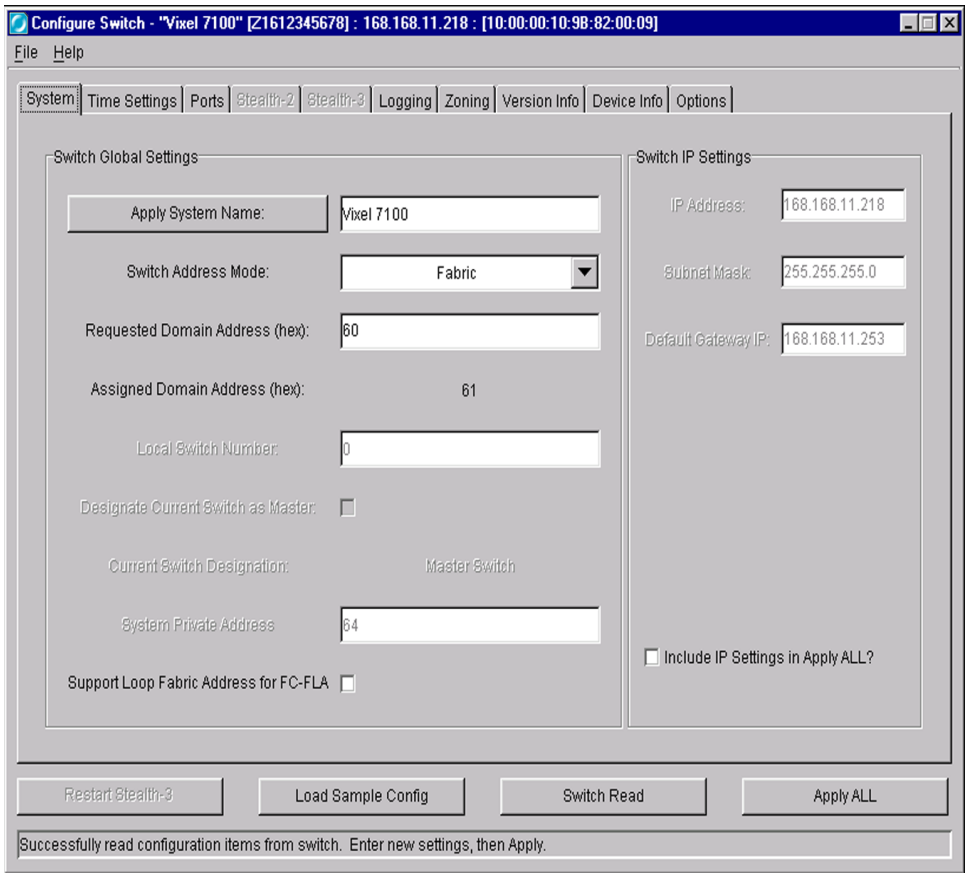
Configure Switch... displays the Configure Switch dialog box, which reads and shows configuration items from the switch (see the configuration status line at the bottom of the *Configure Switch Dialog Box* on page 54). In this dialog box, you can open and save a configuration file or the factory default configuration, apply (download) a configuration to the switch, or read the switch current configuration again. For an in-depth look at all information in this dialog box, see *Configure the Switch Dialog Box* on page 63.

Launch Web Manager (available for switches that use WWN zoning; grayed out if WWN zoning switch is in one of the Stealth Modes) opens the switch Web Manager for WWN zoning and other configuration. For information on the Web Manager, see the documentation that shipped with the switch.

Configure traps displays the Trap Configuration dialog box. For information on the selections in this dialog box, see *The Trap Configuration Dialog Box* on page 21.

Configure firmware image... displays the Firmware Image Configuration dialog box. For information on the selections in this dialog box, see *The Firmware Image Configuration Dialog Box* on page 13.

Configure Switch Dialog Box



Help Menu

The Help menu contains two options:

Contents displays the online help display;

About Softek SANView... displays version and system information, including current port-based license and version numbers of installed modules.

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Interpreting the FC4 Type Value

Instructions follow the table below.

FC4 Type Values

FC4 Type	Mask*	Appropriate Word* in the FC4Type Value
CP IPI-3 Master	00200000	first word
CP IPI-3 Peer	00800000	first word
CP IPI-3 Slave	00400000	first word
FC Services	00000001	second word
FC-AL	00000008	second word
FC-FG	00000002	second word
HIPPI-FP	00000001	third word
IPI-3 Master	00020000	first word
IPI-3 Peer	00080000	first word
IPI-3 Slave	00040000	first word
ISO/IEC 8802 - 2 LLC	00000010	first word
ISO/IEC 8802 -2 LLC/ SNAP	00000020	first word
SBCCS- Channel	02000000	first word
SBCCS- Control Unit	04000000	first word
SCSI-FCP**		
SCSI-GPP	00000200	first word
SNMP	00000010	second word

* Masks and appropriate words are specified in the FC-GS-2 standard. Each word (first, second, third) is represented sequentially by an eight-character set of the 32-character FC4Type value, the first word being the left-most eight-character set. The fourth word is not needed for purposes of finding supported FC-4 types.

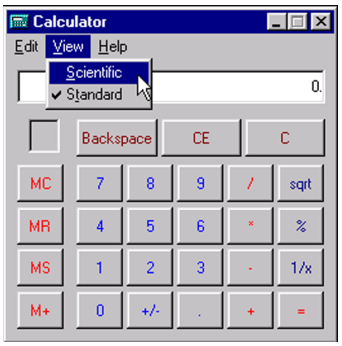
**SCSI-FCP support is specified as “Yes” or “No” in the SCSI-FCP column (right-most) of the SNS Table (see *SNS Table* on page 48), so no AND operation is needed. (The FC-GS-2 standard lists the SCSI-FCP mask as 00000100 and the appropriate word as the first word.)

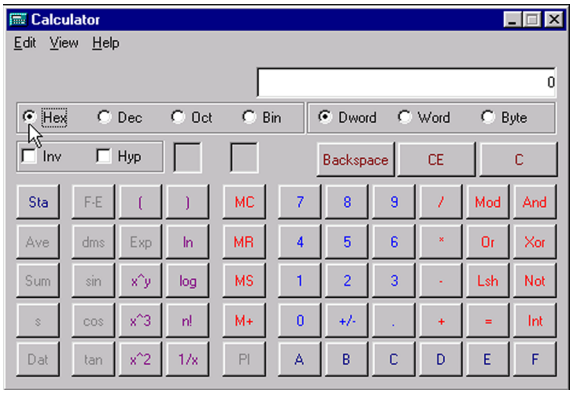
▶ **To perform an AND operation with the desired mask and appropriate word:**

☞ **NOTE**:
These instructions refer to the calculator used on Windows NT.

---

1. From the Windows Start menu, choose **Programs**, **Accessories**, and **Calculator**.
2. In Calculator, choose **Scientific** from the **View** menu.
3. Select **Hex** (upper-left area).




Calculator
Edit View Help
0
Hex Dec Oct Bin
Dword Word Byte
Inv Hyp
Backspace CE C
Sta F-E ( ) MC 7 8 9 / Mod And
Ave dms Exp ln MR 4 5 6 * Or Xor
Sum sin x^y log MS 1 2 3 - Lsh Not
s cos x^3 n! M+ 0 +/- . + = Int
Dat tan x^2 1/x PI A B C D E F

4. Type the desired mask number, omitting any leading zeros. For example, for the SNMP mask number “00000010,” type “10.”
5. Click the **And** button (upper-right area, under the **C** button).
6. Type the value from the appropriate word (eight-character set) of the 32-character value in the FC4Type column, again omitting any leading zeros.

   For example, to find out whether SNMP is supported, type the second word. (For a 32-character value of “00000300000000300000000100000002,” type the second word as “30”—without its leading zeros.)
7. Click the **=** button (near the lower-right corner).

A returned non-zero value indicates that the type is supported (for example, a returned value of “10” indicates that SNMP is supported). The returned value “0” indicates that the type is not supported.

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Switch Port Window

- Port Window 59

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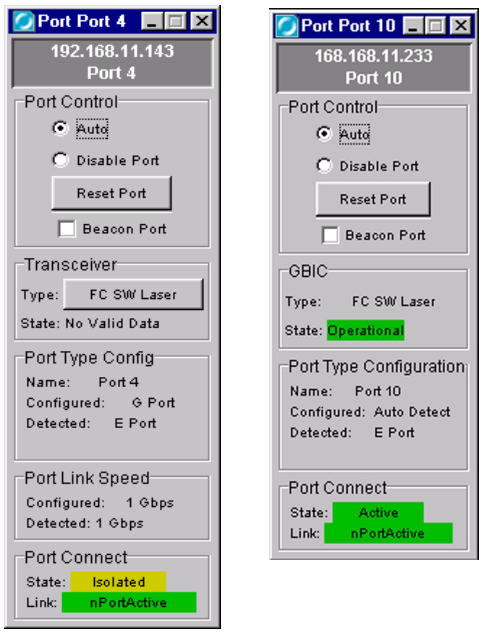
This section describes the functions and selections of the Port window used for Vixel Switches in Softek SANView. The Port window displays the currently selected port control, transceiver type, port link speed (when applicable), and state of the port connection. If one of your ports is not receiving a valid Fibre Channel signal, be sure to check the physical connections and the signals from the devices on this node.

Port Window

The Port window displays the currently selected port control, GBIC type, and state of the port connection. If one of your ports is not receiving a valid Fibre Channel signal, be sure to check the physical connections and the signals from the devices on this node.

Port windows for an SFP (on a Vixel 9200 Fibre Channel Switch) and a GBIC (on a Vixel 7200 Switch)



▶ **To open the Port window:**

Double-click the desired port in the Switch window.

The **Reset Port** button executes a soft reboot to the port, taking the port off line, then brings the port back on line with the existing configuration. Reset a port when it's in an attention (yellow) state or it stays in port initialization for an unusually long time.

Listed below are Port Control descriptions and possible Field values.

Port Control Values

Port Control	***Description***
Auto	The default, on-line port mode. Ports can be in Auto mode only if the switch has derived a valid clock, valid Fibre Channel “K28.5” characters, no LIP(F8)s from the port’s receiver, and the ability to LIP(F7). (These conditions prevent “rogue” ports from being inserted and potentially disrupting the loop.)
Disable Port	Forces a port into the “Off Line” Port Connect State. Disable a port when you want to selectively and non-intrusively remove devices from the loop while troubleshooting.
Reset Port	Executes a soft reboot to the port, taking the port off line, then brings the port back on line with the existing configuration.
Beacon Port	Forces both port’s LEDs to flash on and off (beacon) continuously to bring attention to the selected port. Useful as a locator to remotely alert a technician to take action on a specific port as identified by a Systems Administrator. The blinking will override the state information display until the beaconing is turned off.

GBIC Values

Field	***Possible values***
GBIC Type / Transceiver Type	• DB-9 Serial Inter Copper • DB-9 Serial Intra Copper • FC LW Laser (Longwave) • FC SW Laser (Shortwave) • Unknown • HSSDC Serial Inter Copper • HSSDC Serial Intra Copper • Inter Copper • Intra Copper • No Module • Serial FC LW Laser (Longwave) • Serial FC SW Laser (Shortwave)

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GBIC Values

Field	***Possible values***
GBIC State / Transceiver State	• Beaconing • Faulty GBIC • Manual • No Module • No Valid Data • Operational
Port Type Configuration: Name, Configured, and Detected	Lists the port configuration specified in the Configure Switch dialog box. To view the Configure Switch dialog box, open the Switch window for the desired switch and choose **Configure Switch...** from the Tools menu.
Port Link Speed: Configured and Detected	Lists the port link speed specified in the Ports tab of the Configure Switch dialog box, along with the detected port link speed.
Port Connect State	Active; functional (Green) Disabled; diagnostics failed Isolated; isolated E_Port Link Down (waiting for activity) LIP (F8) Present Loop Back (port in ext loopback) No Media (no GBIC installed) Off Line (port has been disabled by user) (Yellow) TxFault; transmitter fault correction in progress Unknown
Port Connect Link	Inoperative (port waiting for connection) LoopActive (loop carrying traffic) LoopInit (loop initializing, LIP transmitted) LoopOpenInit1 (loop open init state, LISM processing) LoopOpenInit2 (loop open init state, LIP received) LoopUp (loop ready for traffic) LoopNonparticipate (loop in a non-participate state—multiple switches) nPortActive (Port active) nPortInit (Port initializing) nPortReset (Port LR) Unknown

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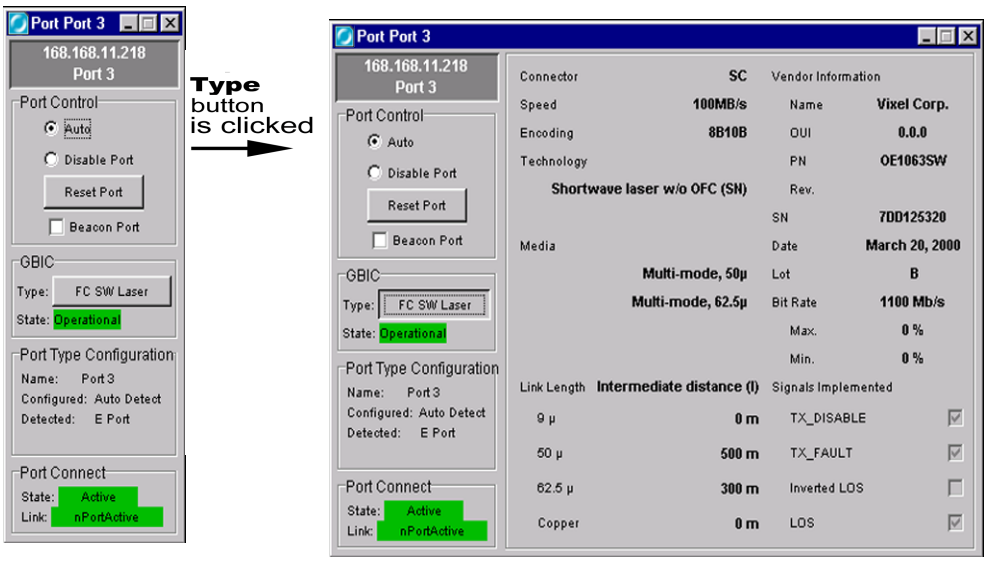
▶ **To view capability and vendor information for a Serial ID GBIC:**

- Click the **Type** button (under GBIC). Port windows for Serial ID GBICs allow you to see information about the GBIC's capability and vendor, as shown below.

*Port window for an FC SW Laser Serial ID GBIC, before and after clicking the **Type** button*



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9

Configure the Switch Dialog Box

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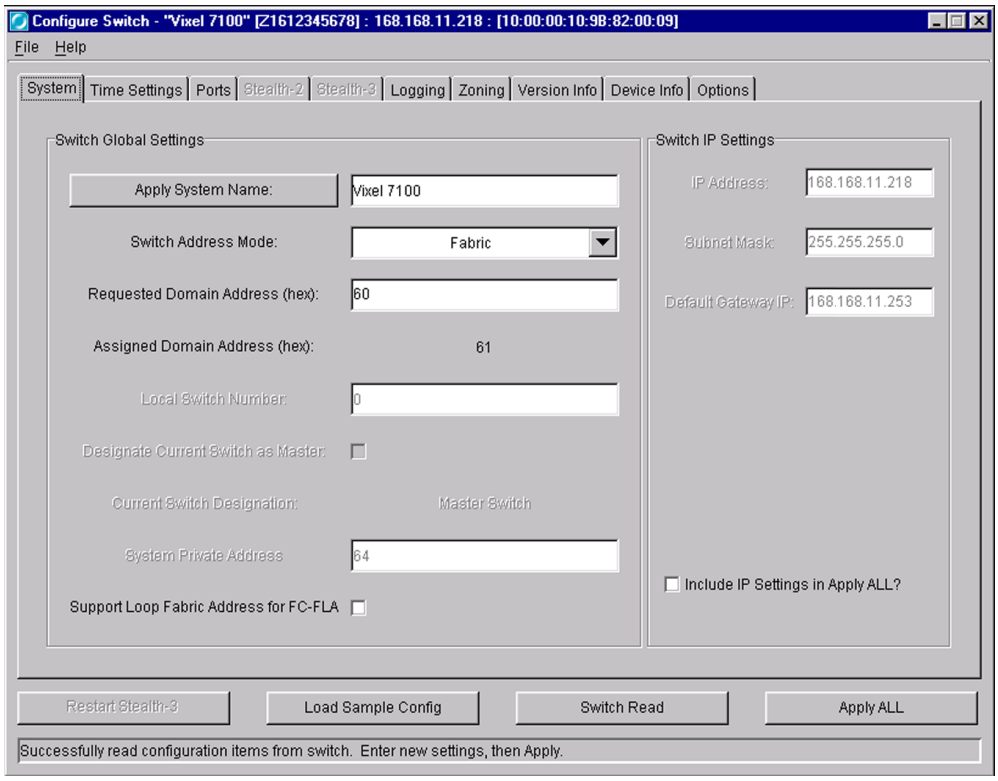
Overview

This section describes the functions and selections of the Configure Switch dialog box used for Vixel Switches managed by Softek SANView. Each dialog box and window is referred to by the name that appears in its title bar.

☞ **NOTE**:
The switch Ethernet Mode is changed through the Configure Agent dialog box, which can be opened by right-clicking the related agent in the Softek SANView Client's Tree frame.

The Configure Switch dialog box (as shown below) reads and displays configuration items from the switch (see the configuration status line at the bottom of the dialog box). In this dialog box, you can open or save a configuration file or zoning configuration file (from the File menu), apply (download) a configuration to the switch, or read the switch's current configuration again. Additional options are available for Vixel 7100/7200 Switches; later firmware versions have more features (some are available by purchase only).

Configure Switch Dialog Box



The buttons at the bottom of the Configure Switch dialog box are available from any selected tab and are described below.

Configure Switch Dialog Box Buttons

Button	***Function***
Restart Stealth-3 (not available for Vixel 8100)	Causes ports that are set to InstantLoop or InstantLoop with Priority to arbitrate for addresses. (Note that these ports arbitrate for addresses every time their links are reestablished.)
Load Sample Config (not available for Vixel 8100)	Loads the switch's sample configuration file without saving the information to flash.
Factory Defaults (Vixel 8100 only)	Loads the local factory default file without saving the information to flash.
Switch Read	Obtains the switch's current configuration and refreshes the Configure Switch dialog box with the new data. (If the current configuration cannot be obtained, the factory default configuration is loaded.)
Apply ALL ("Apply" for Vixel 8100)	Makes all configuration settings permanent on the switch by saving them to flash*; the configuration settings are retained after switch reboot. (If any "Include...in Apply ALL?" or, for Vixel 8100, "Include...in Apply?" checkboxes are unchecked, those settings are excluded from the Apply action.) The Apply ALL action includes the Stealth-3 address negotiation process (which can be initiated separately through the Restart Stealth-3 button). * Note: If the Apply option "Save to Flash" is unchecked (in the Options tab), the configuration settings are saved to RAM only (not flash); at switch reboot, the configuration stored in flash supersedes the configuration saved to RAM.

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The Configure Switch dialog box has configuration options under the **File** menu and, within the dialog box, the following tabs:

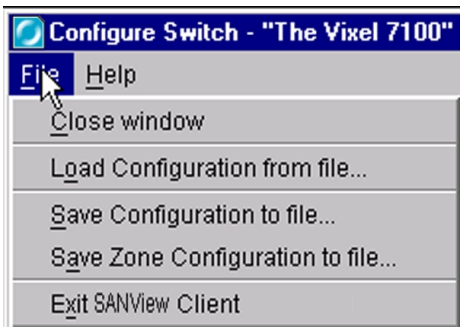
- System
- Time Settings
- Ports
- Stealth-2 or Stealth (depending on the switch model)
- Stealth-3 (for Vixel 7100 / 7200)
- Logging
- Zoning
- Version Info
- Device Info
- Sensor Info (for Vixel 8100)
- Options (for Vixel 7100 / 7200 or Vixel 9100 / 9200 / 9300).

Tabs are grayed out if their options do not apply in the selected Switch Address Mode (Stealth-3, Stealth-2, Stealth).

File Menu

The **File** menu for the Configure Switch dialog box has the options shown below.

File Menu for the Configure Switch Dialog Box



Between the standard **Close window** and **Exit Softek SANView Client** options are several options for opening, closing, and saving configurations. You can save configuration files to record a particular set of configurations or to download at a later time.

Load Configuration from file... opens a previously saved configuration file or zone configuration file. Make sure you click **Apply** or **Apply ALL** if you want to download this configuration information to the switch.

Save Configuration to file... saves the configuration information shown in the Configure Switch dialog box (all tabs) to a file.

Save Zone Configuration to file... saves the port-based zoning configuration information shown in the Configure Hub dialog box (Zoning tab only) to a file. (This option is not available for WWN-zoning switches that are in Fabric Mode or Fabric (Public/Private) Mode.)

All device configuration files are saved to the appropriate vendor directory in*:

- (Windows) `C:\SANView\SIFileSystemRoot\deviceconf\`
- (UNIX) `/opt/SANView/SIFileSystemRoot/deviceconf/`

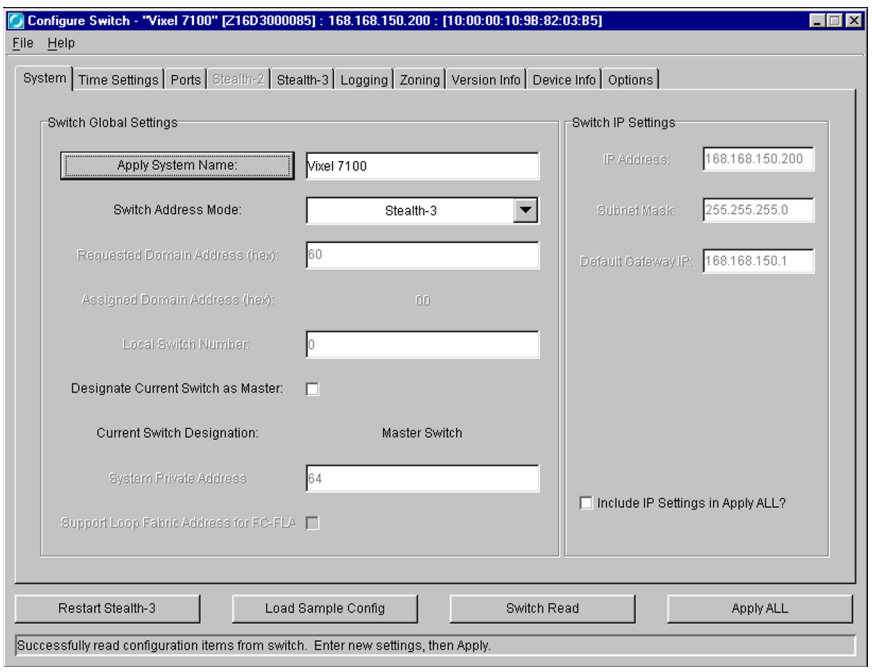
*Files are located on the Softek SANView Server system. The listed locations assume that the default installation directory for Softek SANView was accepted and that Softek SANView's Root Directory parameter is unchanged. (By default, Softek SANView's Root Directory is named "SIFileSystemRoot" and is placed inside the accepted installation directory.)

The **Help** menu contains two options: **Contents** for online help display and **About** for system and version information.

System Tab

Through the System tab, you can configure the switch name, choose the Switch Address Mode, define the switch's domain address or switch number, and change its IP Address. Note that the available options and modes differ according to the switch model number and active firmware version.

System Tab, Configure Switch Dialog Box (shown for a Vixel 7100)



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☞ **NOTE:**
When the Switch Address Mode is changed for a Vixel 7100/7200 Switch, the switch keeps any existing Zoning configuration. Other configuration settings are replaced by the default settings of the new Switch Address Mode, except when changing from Fabric Mode to Fabric (Public/Private) Mode.

Textboxes and selections in the System tab are described below.

System Tab Options

Textbox or Selection	***Applicable Mode(s)***	***Description***
Apply System Name (or, for Vixel 8100, System Name)	All	User-defined name for switch. The Apply System Name button (available for Vixel 7100/7200) downloads only the system name to the switch.
Switch Address Mode	---	The method used by the switch to assign addresses to connected devices (availability depends on switch model and version of running firmware): • Fabric for fabric-capable devices. • Fabric (Public/Private) for a mix of public hosts and private (or public) storage devices. • Stealth-3 for private devices; allows address negotiation. • Stealth-2 for private devices; makes Vixel 7100/7200 interoperable with Vixel 8100 in Stealth Mode. • Stealth for private devices on Vixel 8100.
Request Domain Address	Fabric, Fabric (Public/Private)	When this checkbox is checked, the new configuration applied, and the request accepted (as indicated in "Assigned Domain Address"), uniquely identifies the switch. Address range is 01 - EF (hexadecimal); default is 01.

System Tab Options

Textbox or Selection	***Applicable Mode(s)***	***Description***
Local Switch / Fabric Number	Stealth, Stealth-2	Identifies the switch in a cascaded topology and assigns a group of addresses. Use "0" for central (root) switch and consecutive numbers for the cascaded (remote) switches.
Designate Current Switch as Master	Stealth-3	When this checkbox is checked, the new configuration applied, and the request accepted (as indicated by "Current Switch Designation"), identifies the switch as the master (central) switch in a cascaded topology. If left unchecked when a second switch is connected, the switches arbitrate for mastership and mastership is assigned to the switch with the lowest World-Wide Name (WWN). This switch retains its master designation until it disconnected. **Note:** In a star configuration, the designated master switch must be the central switch.
System Private Address	Fabric (Public / Private)	Specifies the number of AL_PAs (per port) that are reserved for private devices when the switch is running in Fabric (Public / Private) Mode. The default number is 64, which allows private devices the range 0x73-0xEF; public devices are given access to the remaining AL_PAs, starting at 0x01.
Support Loop Fabric Address for FC-FLA	Fabric, Fabric (Public / Private)	When this checkbox is checked, the switch reserves the address 0x01 for Loop Fabric Address (and for N_Port devices). When unchecked, the address 0x00 is reserved instead. **Note:** Loop Fabric Addressing commands are defined in the Fibre Channel Fabric Loop Attachment (FC-FLA) specification.

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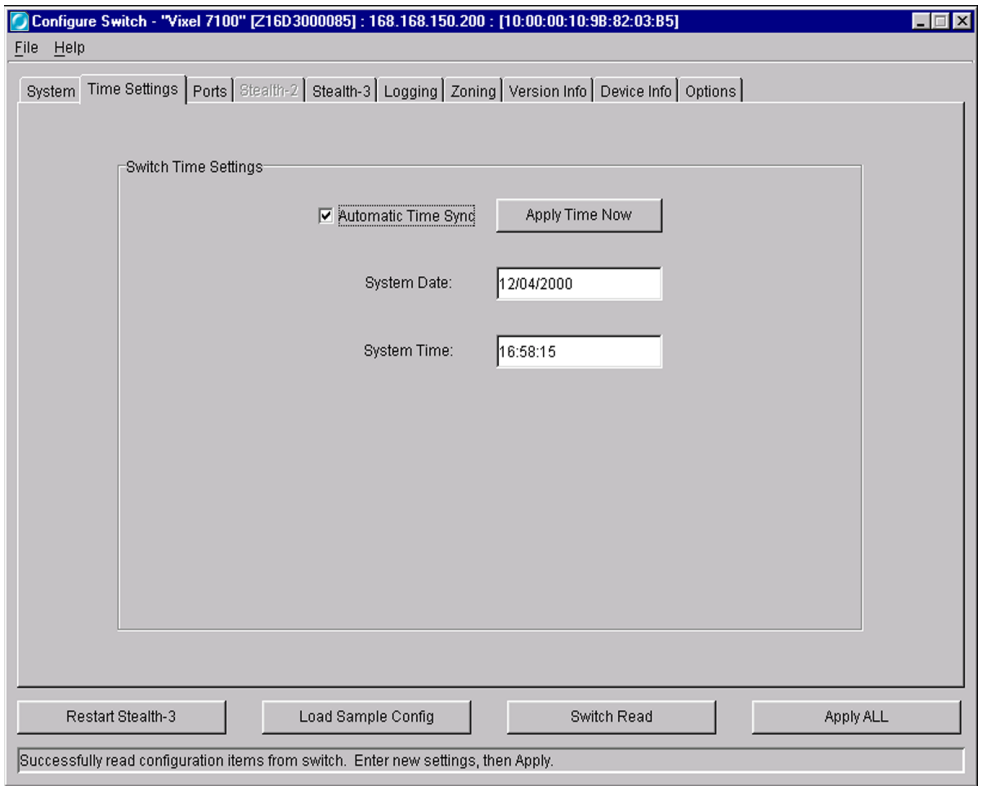
System Tab Options

Textbox or Selection	***Applicable Mode(s)***	***Description***
Automatic Time Sync (Vixel 8100 only; for Vixel 7100/7200, see the Time Settings tab)	All	Synchronizes the switch with the PC clock.
IP Address	All	Lists the IP Address of the switch.
Subnet Mask	All	A filter (bit mask) used to determine what subnet an IP Address belongs to. (The default setting of 255.255.255.0 is usually appropriate for IP Addresses in Class C networks.)
Default Gateway IP	All	Lists the gateway IP Address used by the switch.
Include IP Settings in Apply ALL? (or, for Vixel 8100, "...in Apply?")	All	Must be checked to save changes to IP parameters when **Apply ALL** is clicked (**Apply** for Vixel 8100).

Time Settings Tab

The **Time Settings** tab (not available for Vixel 8100) allows you to enable the automatic time synchronization so that the switch synchronizes with the computer's clock.

Time Settings Tab, Configure Switch Dialog Box



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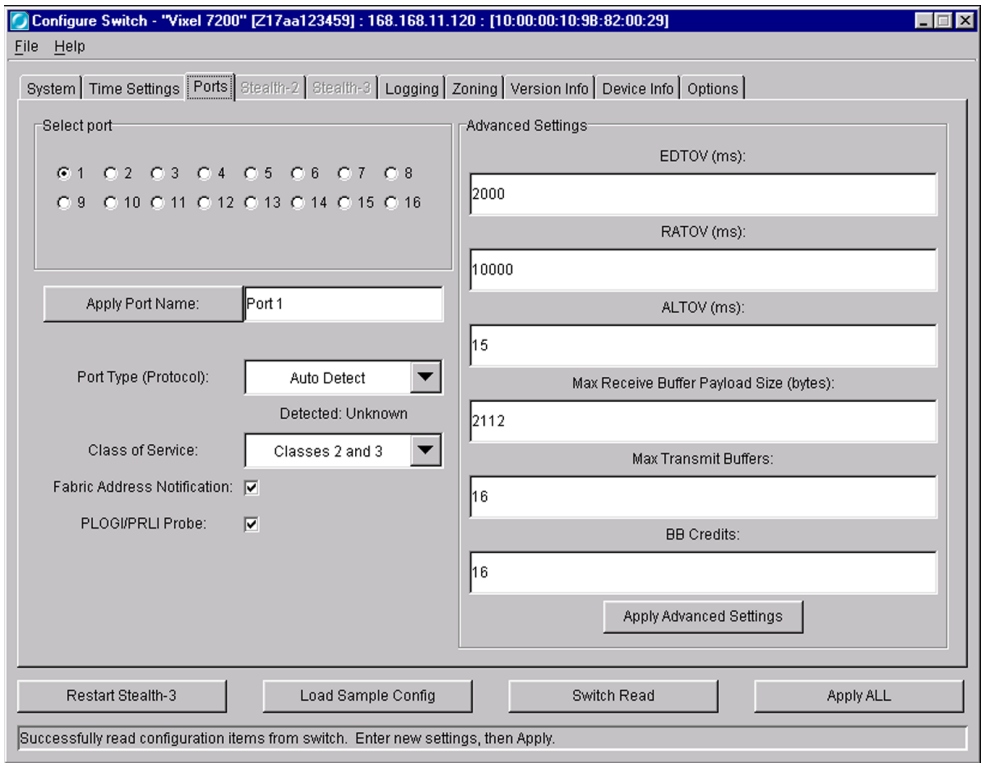
Ports Tab

☞ **NOTE:**
The port types (protocols) can also be configured in the Stealth, Stealth-2, or Stealth-3 tab.

Through the **Ports** tab, you can name ports, select the appropriate port types (protocols), and select the desired class(es) of service. Advanced Settings should be completed by Vixel Systems Engineers.

Ports Tab, Configure Switch Dialog Box



Textboxes and selections in the Ports tab are described below.

Ports Tab Options

Textbox or Selection	***Description***
Apply Port Name	Saves the entered port name for the selected port.
Port Type (Protocol)	• AutoDetect (default for Vixel 7100/7200): Automatically detects the protocol used by the port. Valid for all Switch Address Modes on Vixel 7100/7200. • E_Port: Cascaded switch port. Valid for Fabric and Fabric (Public/Private) Mode. • F_Port: Used for attaching another switch (switch to switch connection) or for a direct point-to-point connection for individual hosts or raids. Full duplex, no arbitration, faster transfer, used for initiators. Valid for all Switch Address Modes; device type must be "Switch_8" or "Switch_16" for Stealth-2 ("Fabric" for Stealth). • FL_Port: Switch loop port. Valid for Fabric and Fabric (Public/Private) Mode. • G_Port: Generic port; can act as either F_Port or E_Port. Valid for Fabric and Fabric (Public/Private) Mode on Vixel 7100/7200. • Stealth Loop (default for Vixel 8100): Used for private devices. Valid for all Stealth Modes.
Port Link Speed (Vixel 9000 Series Switches only)	Sets the speed for the selected port at Auto Detect, 1 Gbps, or 2 Gbps.
Class of Service	Uses the selected class of service, or set of delivery characteristics, on the selected port. Class 2 confirms frame delivery while Class 3 does not. The default setting of Classes 2 and 3 is sufficient for most applications.

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Ports Tab Options

Textbox or Selection	***Description***
Fabric Address Notification	When checked (enabled) and an initialization event occurs, the Fabric port sends a Fabric Address Notification (FAN) Extended Link Service to all FLOGI-logged-in, attached ports. These ports can then authenticate active Exchanges and operating parameters, such as BB credits. FAN is available for public ports on a Vixel 7100/7200 Switch running in Fabric or Fabric (Public/Private) Mode (FAN is enabled by default in these conditions).
PLOGI/ PRLI	When checked (enabled) and when one or more devices on the selected switch port fail to register their FC-4 types within the expected time, the switch probes these devices with a port login (PLOGI) and a process login (PRLI) to obtain their FC-4 types, then registers the FC-4 types in the Simple Name Server (SNS) database. PLOGI/PRLI is available for public ports on a Vixel 7100/7200 Switch running in Fabric or Fabric (Public/ Private) Mode (PLOGI/PRLI is enabled by default in these conditions). ***Note:*** *To find out how many devices on this port responded to the PRLI probe for FC4 types, choose* ***Port Link Statistics*** *from the* ***View*** *menu (of the Switch window) and see the PRLIResp column.*
EDTOV	Error detection time-out value in milliseconds (period).
RATOV	Resource allocation time-out value in milliseconds (period).
ALTOV	Loop initialization time-out value in milliseconds (period); valid for FL_Port port type or one of the Stealth Modes only.

Ports Tab Options

Textbox or Selection	***Description***
Max Receive Buffer Payload Size (bytes)	Number of bytes allowed in each receive buffer; valid range is 128-2112 (the number of available receive buffers is set in the BB Credits field).
Max Transmit Buffers	Number of transmit buffers available for transmitting Class 2 or 3 frames to the attached NxPort, for buffer-to-buffer flow control in the direction from the attached NxPort (if applicable) to FxPort.
BB Credits	Buffer-to-buffer credits—the number of receive buffers available for holding Class 2 or 3 frames from the attached NxPort, for buffer-to-buffer flow control in the direction from the attached NxPort (if applicable) to FxPort.

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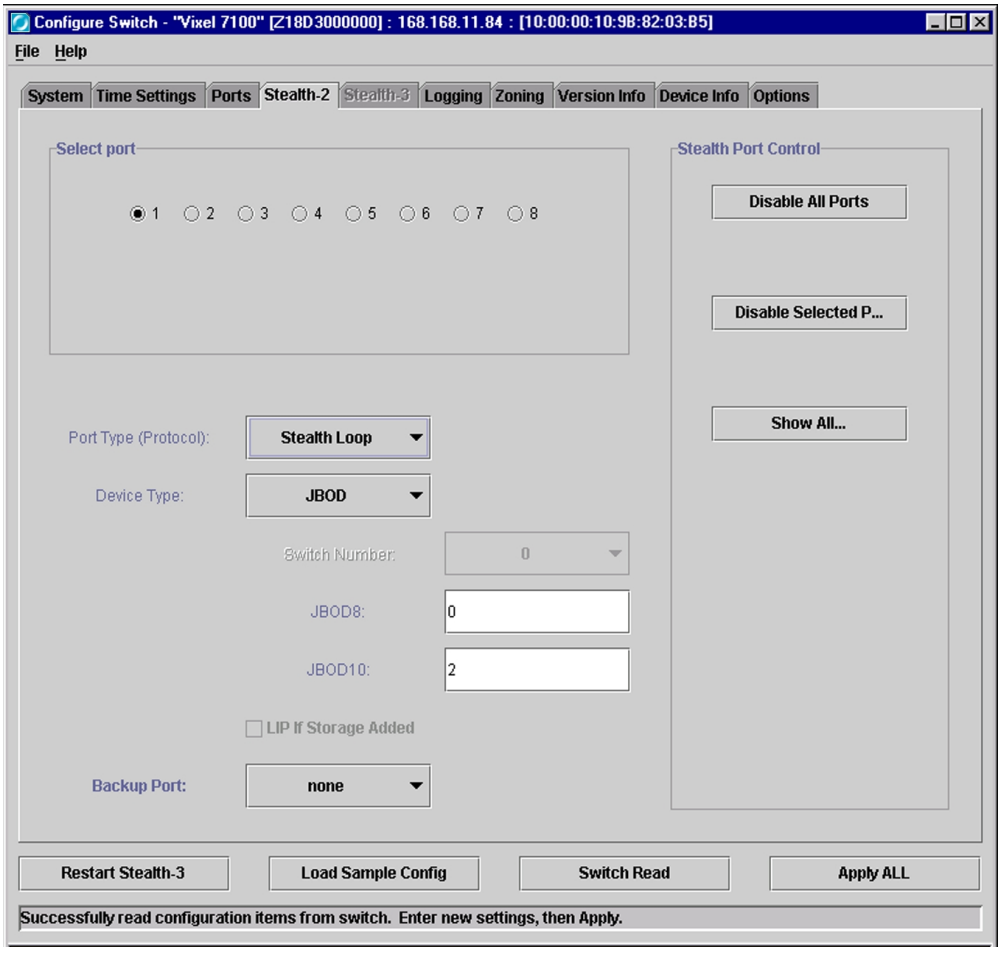
Stealth-2/Stealth Tab

The **Stealth-2** tab (Stealth tab for Vixel 8100) allows you to configure a port when operating under Stealth-2 or Stealth Mode. Stealth-2 Mode is used to interoperate with Vixel 8100s in Stealth Mode. The only difference between these modes is the added Switch_16 device type in Stealth-2 Mode (used for 16-port switches).

Stealth-2 Tab, Configure Switch Dialog Box



☞ **NOTE:**
If you don't want to use the default configuration values for port type and device type, disable all ports before configuring the switch by clicking **Disable All Ports**. Disabling all ports prevents ALPA contention.

Textboxes and selections in the **Stealth-2** tab (Stealth tab for Vixel 8100) are described below.

Stealth-2 Tab Options

Textbox or Selection	***Description***
Select port	Allows you to select a port to configure.
Port Type (Protocol)	• AutoDetect (default for Vixel 7100/7200): Automatically detects the protocol used by the port. Valid for all Switch Address Modes on Vixel 7100/7200. • E_Port: Cascaded switch port. Valid for Fabric and Fabric (Public/Private) Mode. • F_Port: Used for attaching another switch (switch to switch connection) or for a direct point-to-point connection for individual hosts or raids. Full duplex, no arbitration, faster transfer, used for initiators. Valid for all Switch Address Modes; device type must be “Switch_8” or “Switch_16” for Stealth-2 (“Fabric” for Stealth). • FL_Port: Switch loop port. Valid for Fabric and Fabric (Public/Private) Mode. • G_Port: Generic port; can act as either F_Port or E_Port. Valid for Fabric and Fabric (Public/Private) Mode on Vixel 7100/7200. • Stealth Loop (default for Vixel 8100): Used for private devices. Valid for all Stealth Modes.

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Stealth-2 Tab Options

Textbox or Selection	***Description***
Device Type	• Fabric (Stealth Mode only) • Host • Hub (Stealth Mode only)—Used when the hub's connected devices need to communicate with each other and when address consumption is not a concern. (If the connected devices do not need to communicate with each other, you can attach the hub to a JBOD-defined port, which uses much fewer address sets.) A device defined as a "Hub" has a restriction of 10 total AL_PAs. Note the switch maximum of two Hub ports; one Hub port consumes 63 AL_PAs while two Hub ports consume 101 AL_PAs. • JBOD—Used for JBODs and for hubs when the connected devices do not need to communicate with each other. Type in the quantity of JBOD8 and/or JBOD10 devices for this port type. • None—Used for backup ports. No ALPAs assigned. • RAID • Switch_8 and Switch_16 (Stealth-2 only)—Used for 8-port and 16-port switches, respectively. • Switch Number/Fabric Number—Central (root) switches are always "0". Cascaded switches must each have a unique identifying number within the maximum allowed for its particular model number, as long as that maximum is within the central switch's maximum (see the switch's documentation).
LIP If Storage Added	When checked, notifies devices on the selected port of new storage by propagating LIPs (Loop Initialization Primitives). This option is available for initiators (switches, hosts, hubs) only.
Backup Port	Sets up the selected port as a failover path for connected devices. The switch automatically routes data to the primary port when the primary port's path is reestablished.

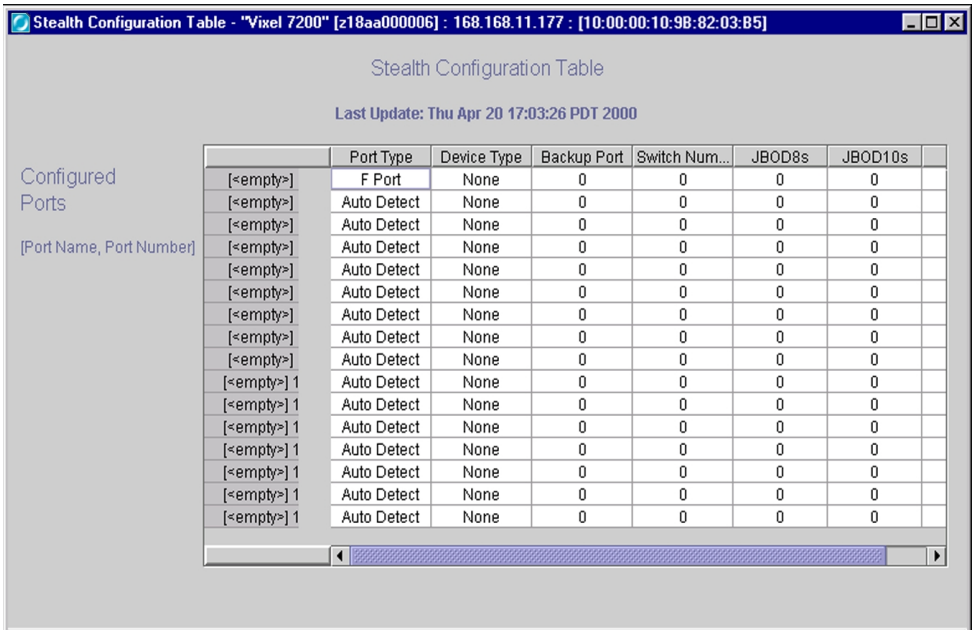
Stealth-2 Tab Options

Textbox or Selection	***Description***
Disable All Ports or Disable Selected Port	Within the Configure Switch dialog box, resets all the quantity fields, sets the Device type to None, sets the Port type to Stealth Loop, deselects LIP if Storage Added, sets the JBOD quantity to zero, clears the Fabric number or Switch number field. Use this to prevent AL_PA contention during configuration or to clear the factory defaults.
Show All...	Displays settings for all ports at a glance.
Validate Port (Vixel 8100)	Checks the configuration settings for the selected port and displays error messages if invalid settings are found.

To view all ports at one time, click **Show All...** to display the Stealth Configuration Table window (below). To view more columns, move the scroll bar or resize the window.

(Note on Vixel 8100 Fabric Switches: If configuration settings in this window are not the same as those in the Stealth tab, the settings probably weren't validated. Make sure you click **Validate Port** in the **Stealth** tab after configuring a port.)

Stealth Configuration Table Window



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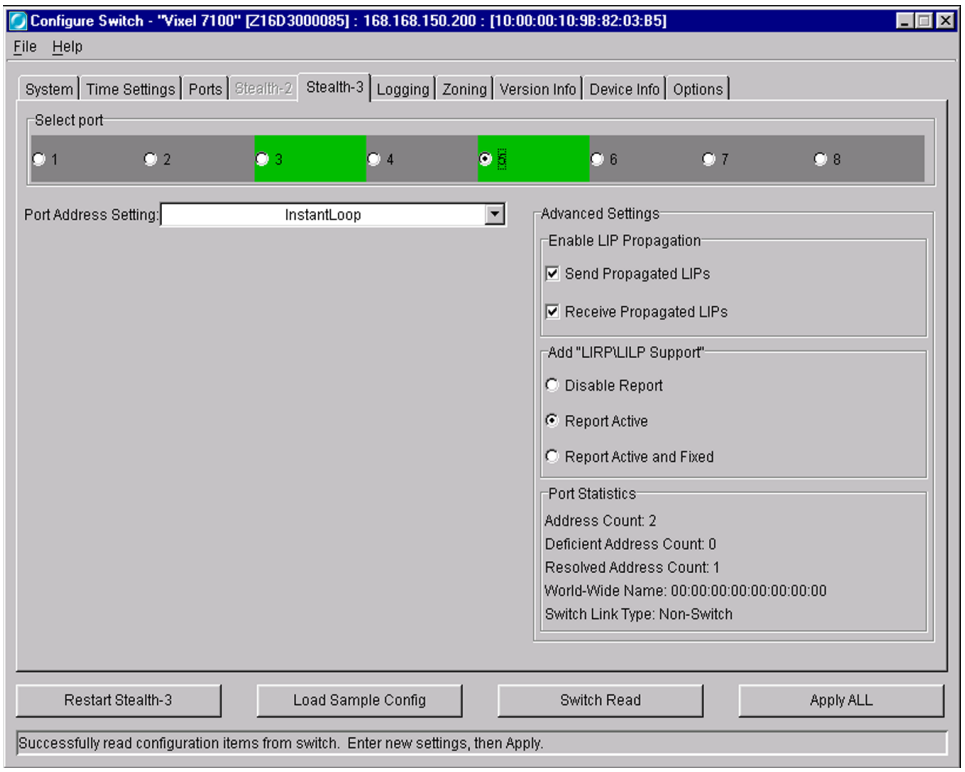
Stealth-3 Tab

The **Stealth-3** tab (not available for Vixel 8100) allows you to select the desired port address setting and advanced settings for LIP (Loop Initialization Primitive) propagation and LIRP / LILP support for ports when the switch is running under Stealth-3 Mode (or when the switch is running under Fabric (Public / Private) Mode and one or more ports are using private addresses). The advanced settings are downloaded to the switch when **Apply ALL** or **Apply** is clicked; note that the advanced settings can be applied separately (without applying other configuration settings) through the **Apply Advanced Settings** button. This tab also displays port statistics for addresses and world-wide names.

The port colors indicate whether the port has obtained sufficient addresses: green indicates sufficient addresses while yellow indicates insufficient addresses (gray indicates that no GBIC is inserted in the port). If all ports have sufficient addresses, no configuration is needed. If more configuration is needed, choose the appropriate port address setting for each port according to their descriptions below.

Stealth-3 Tab, Configure Switch Dialog Box


Configure Switch - "Vixel 7100" [Z16D3000085] : 168.168.150.200 : [10:00:00:10:9B:82:03:B5]
File Help
System Time Settings Ports Stealth-2 Stealth-3 Logging Zoning Version Info Device Info Options
Select port
1 2 3 4 5 6 7 8
Port Address Setting: InstantLoop
Advanced Settings
Enable LIP Propagation
Send Propagated LIPs
Receive Propagated LIPs
Add "LIRP\LILP Support"
Disable Report
Report Active
Report Active and Fixed
Port Statistics
Address Count: 2
Deficient Address Count: 0
Resolved Address Count: 1
World-Wide Name: 00:00:00:00:00:00:00:00
Switch Link Type: Non-Switch
Restart Stealth-3
Load Sample Config
Switch Read
Apply ALL
Successfully read configuration items from switch. Enter new settings, then Apply.

Textboxes and selections in the **Stealth-3** tab are described below.

Stealth-3 Tab Options

Textbox or Selection	***Description***
Port Address Setting	• **InstantLoop** (factory default setting for all ports) allows the port to negotiate for addresses. Any existing address conflicts are resolved to ensure that each device has a unique address. Devices connected to this port can communicate with other switch ports but not with each other. Use InstantLoop for switch-to-switch connections (with either the F_Port or the AutoDetect port type selected), devices that have soft-addressing capability, and devices with hard addresses. • **Intra-Loop Communication Range** allows you to select one pre-arranged group of addresses to assign to the port. Under this port address setting, the loop of devices connected to the port can communicate with one another and with all other switch ports. Use Intra-Loop Communication Range when the loop of devices on the port need to communicate with each other. • **ExpertMode** allows you to select individual address(es) to assign to the port. Use ExpertMode for devices with hard addresses or with multiple contiguous addresses when the devices did not successfully negotiate for addresses under the InstantLoop port address setting. Note: A port set to ExpertMode can use only the AL_PAs assigned through ExpertMode. These assigned AL_PAs are not available for use by any other ports; therefore, exercise caution when the topology involves other hard-addressed devices. In multiple-switch configurations, ensure that ExpertMode-assigned addresses are unique on each switch. (A conflict would prevent the switches from interoperating.)
Address Table (visible only when **Intra-Loop Communication Range** or **ExpertMode** is selected)	Lists all addresses available for the switch, by Loop ID (0-125) and AL_PA. Allows you to assign addresses to the selected port by clicking the desired address range or individual address; the Intra-Loop Communication Range port address setting allows one pre-arranged group of addresses per port (for example, the group of AL_PAs that begin with “0x2”) while the ExpertMode port address setting allows unlimited individual addresses within the boundaries of the Address Table.

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Stealth-3 Tab Options

Textbox or Selection	***Description***
Enable LIP Propagation	• **Send Propagated LIPs** sends notification of new devices on the selected port by propagating LIPs (Loop Initialization Primitives) to all ports (and their connected devices) that are designated as "LIP Receiver." • **Receive Propagated LIPs** causes the devices on the selected port to receive notification (through LIP (Loop Initialization Primitive) propagation) of recently connected devices on ports that are designated as "LIP Trigger."
Add "LIRP/ LILP Support"	• **Disabled:** No LILP or LIRP frames are sent out, which cause initiators (such as hosts) to probe the entire address space for discovery of private loop devices. • **Report Active:** The frame contains only the addresses that are being used by the switch ports; assigned addresses that aren't being used are not included in the frame. Initiators (such as hosts) transmit PLOGIs only to those addresses included in the frame. • **Report Active and Fixed:** The frame contains all addresses that were assigned to the ports, whether or not the addresses are being used. Initiators (such as hosts) transmit PLOGIs only to those addresses included in the frame. Use this setting to avoid rebooting hosts that must manually discover targets.

Stealth-3 Tab Options

Textbox or Selection	***Description***

Port Statistics	• **Address Count:** Number of addresses assigned to the selected port.
	• **Deficient Address Count:** Number of needed addresses that the selected port has been unable to obtain.
	• **Resolved Address Count:** Number of addresses on the selected port that were changed to resolve address conflicts with other ports.
	• **World-Wide Name:** The World-Wide Name of the switch that is connected to the selected port, if one indeed is connected. (World-Wide Names are registered, unique 64-bit identifiers assigned to many devices.)
	• **Switch Link Type:** Indicates whether another switch running under Stealth-3 Mode is connected to the selected port:
	  • "Backup Link" for a connected switch on a back-up port.
	  • "Non-Switch" for no connected switch.
	  • "Primary Link" for a connected switch that is currently carrying traffic.

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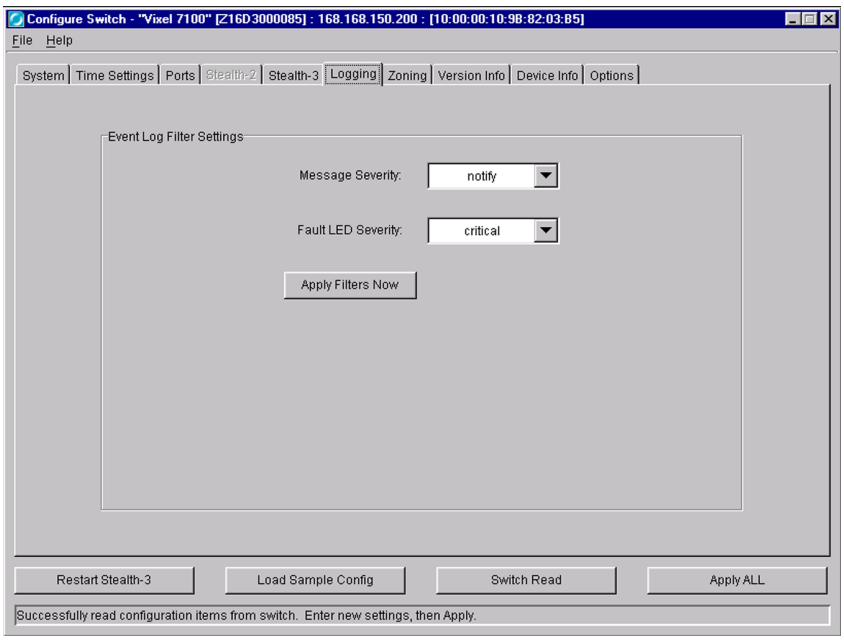
Logging Tab

☞ **NOTE:**
To view logged messages, choose **Device Events** from the View menu (Switch window). The most recent entries appear at the top of the log. Each entry includes a severity level, time stamp, and error message.

Through the **Logging** tab, you can set the lowest severity level at which messages get logged and at which messages trip the Fault LED (found on the Switch window).

Logging Tab, Configure Switch Dialog Box


Configure Switch - "Vixel 7100" [Z16D3000085] : 168.168.150.200 : [10:00:00:10:9B:82:03:B5]
File Help
System Time Settings Ports Stealth-2 Stealth-3 Logging Zoning Version Info Device Info Options
Event Log Filter Settings
Message Severity: notify
Fault LED Severity: critical
Apply Filters Now
Restart Stealth-3
Load Sample Config
Switch Read
Apply ALL
Successfully read configuration items from switch. Enter new settings, then Apply.

In the figure above, messages that are at the Notify severity level or higher get logged. The Fault LED is tripped by messages at the Critical severity level or higher (Critical, Alert, or Emergency).

Severity levels are defined as follows:

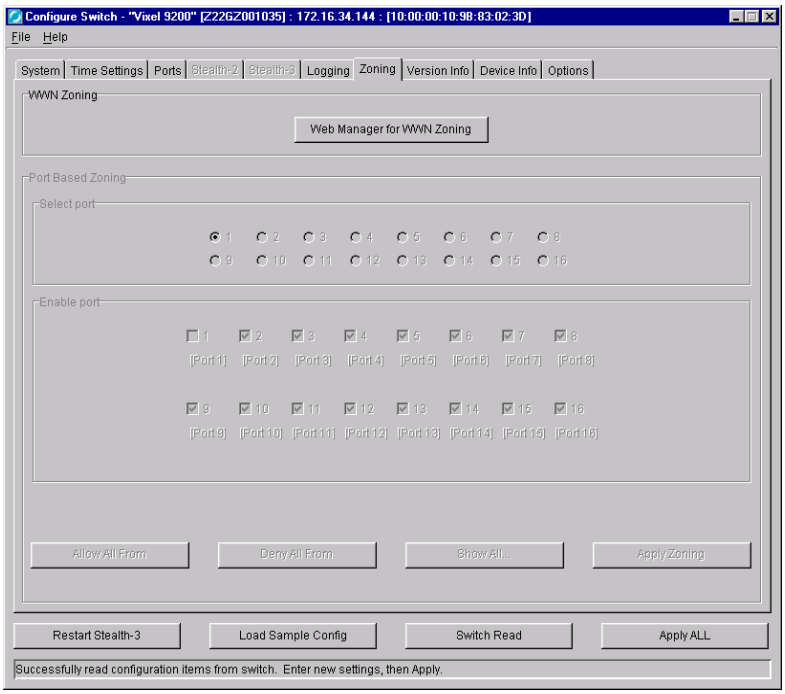
- Emergency—immediate action required; system failing
- Alert—unrecoverable condition reported; major event in progress
- Critical—event failed with possible loss of integrity
- Error—condition failed; action required
- Warning—failed event occurred; no action required
- Notify—configuration error or abnormal event occurred; no action required
- Info—event occurred; no action required
- Debug—internal message for development
- Mark—message marker

Zoning Tab

☞ **NOTE**:
The zoning method used in Fabric Mode and Fabric (Public / Private) Mode—port-based or WWN-based—depends on the switch model and firmware. (Stealth Modes all use port-based zoning.) While port-based zoning options are set in the Configure Switch dialog box, WWN-based zoning options are set through the switch's web manager or Command Line Interface (CLI), which can both be launched from the Softek SANView Client.

Through the **Zoning** tab, you can configure port-based zoning to divide root switches into multiple virtual zones (or work groups), similar to Virtual Local Area Networking (VLAN). You can configure zoning for one port at a time in the **Zoning** tab, or you can click **Show All...** to view and configure zoning for all ports on the selected switch. The File menu allows you to save zoning configuration separately from the other switch configuration; the **Apply Zoning** button (not available for Vixel 8100) allows you to apply the zoning configuration without applying other configuration settings. To apply zoning configuration along with other configuration settings, make sure the **Include Zone Settings in Apply ALL?** checkbox is checked in the **Options** tab under **Apply Options** (or, for Vixel 8100, the "**... in Apply?**" checkbox in the **Zoning** tab).

Zoning Tab, Configure Switch Dialog Box (for a switch that uses WWN-based zoning)


Configure Switch - "Vixel 9200" [Z22GZ001035] : 172.16.34.144 : [10:00:00:10:9B:83:02:3D]
File Help
System Time Settings Ports Stealth-2 Stealth-3 Logging Zoning Version Info Device Info Options
WWN Zoning
Web Manager for WWN Zoning
Port Based Zoning
Select port
Enable port
[Port 1] [Port 2] [Port 3] [Port 4] [Port 5] [Port 6] [Port 7] [Port 8]
[Port 9] [Port 10] [Port 11] [Port 12] [Port 13] [Port 14] [Port 15] [Port 16]
Allow All From
Deny All From
Show All...
Apply Zoning
Restart Stealth-3
Load Sample Config
Switch Read
Apply ALL
Successfully read configuration items from switch. Enter new settings, then Apply.

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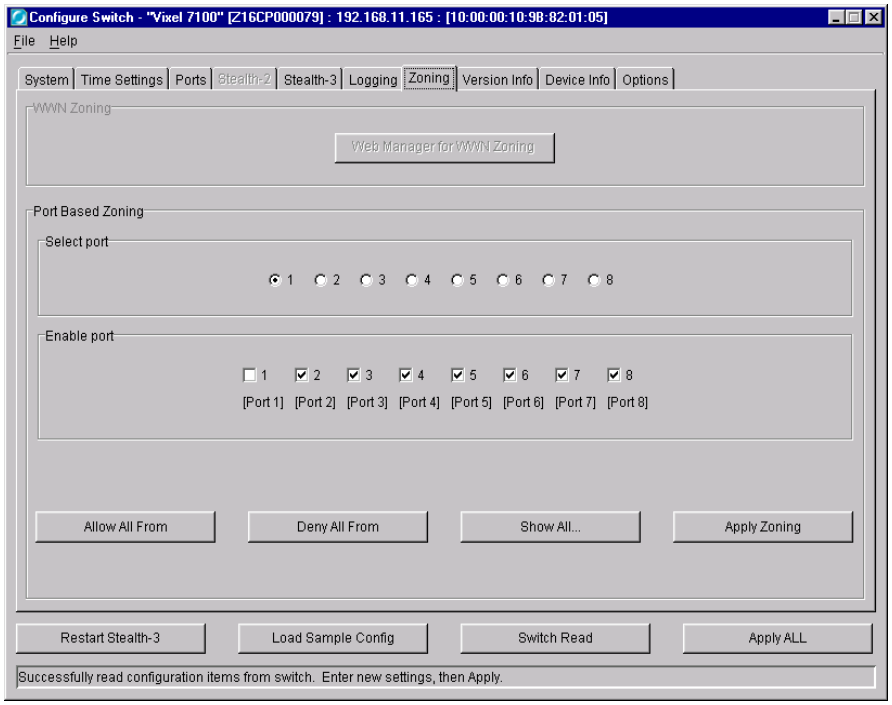
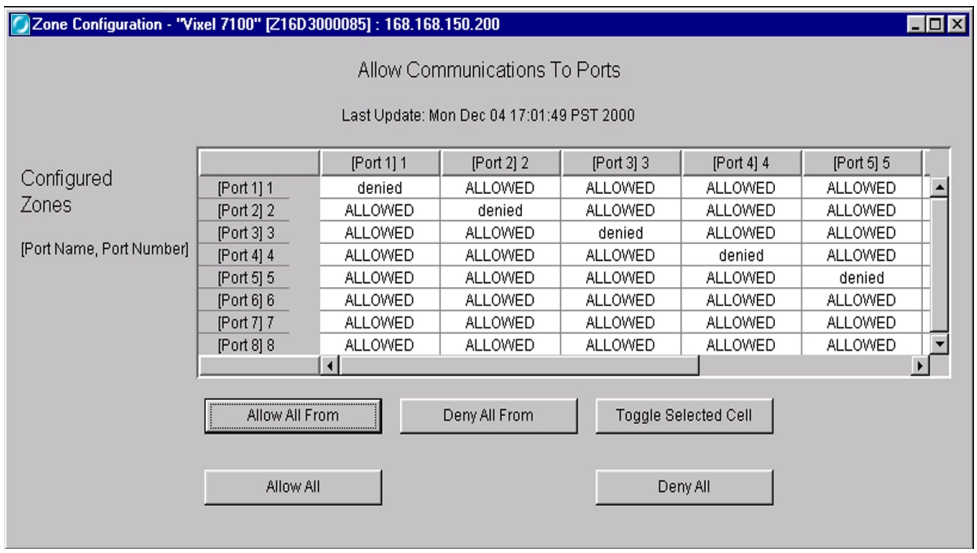
Zoning Tab, Configure Switch Dialog Box (for a switch that uses port-based zoning)


Configure Switch - "Vixel 7100" [Z16CP000079] : 192.168.11.165 : [10:00:00:10:9B:82:01:05]
File Help
System Time Settings Ports Stealth-2 Stealth-3 Logging Zoning Version Info Device Info Options
WWN Zoning
Web Manager for WWN Zoning
Port Based Zoning
Select port
1 2 3 4 5 6 7 8
Enable port
1 2 3 4 5 6 7 8
[Port 1] [Port 2] [Port 3] [Port 4] [Port 5] [Port 6] [Port 7] [Port 8]
Allow All From
Deny All From
Show All...
Apply Zoning
Restart Stealth-3
Load Sample Config
Switch Read
Apply ALL
Successfully read configuration items from switch. Enter new settings, then Apply.

▶ **To configure or view port zoning for all ports at once:**

- Click **Show All...** to display the Zone Configuration window. To enable or disable communications between two ports, select the intersecting cell and click **Toggle Selected Cell**. The other buttons allow you to deny or allow communications, either in a selected row or for all ports.

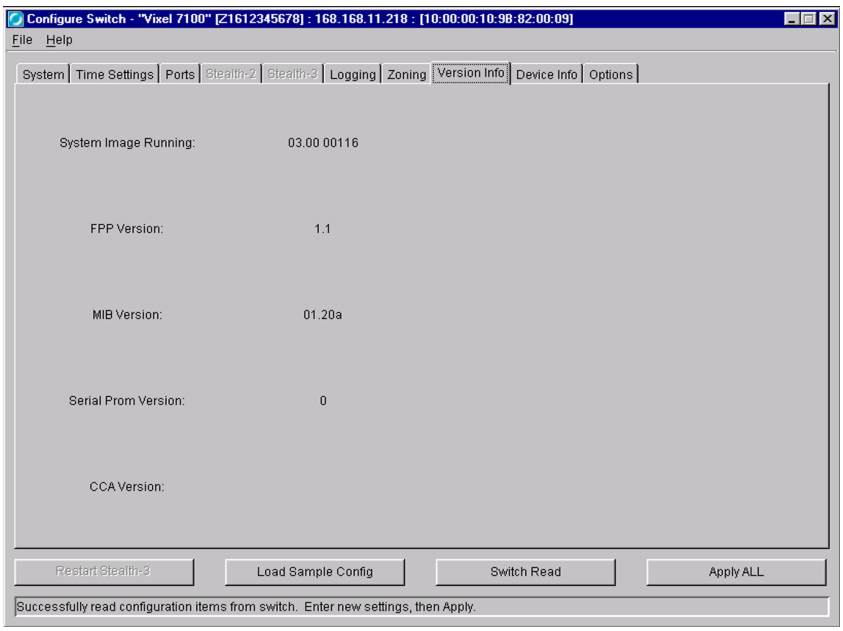
Zone Configuration Window


Zone Configuration - "Vixel 7100" [Z16D3000085] : 168.168.150.200
Allow Communications To Ports
Last Update: Mon Dec 04 17:01:49 PST 2000
Configured Zones
[Port Name, Port Number]
[Port 1] 1 [Port 2] 2 [Port 3] 3 [Port 4] 4 [Port 5] 5
[Port 1] 1 denied ALLOWED ALLOWED ALLOWED ALLOWED
[Port 2] 2 ALLOWED denied ALLOWED ALLOWED ALLOWED
[Port 3] 3 ALLOWED ALLOWED denied ALLOWED ALLOWED
[Port 4] 4 ALLOWED ALLOWED ALLOWED denied ALLOWED
[Port 5] 5 ALLOWED ALLOWED ALLOWED ALLOWED denied
[Port 6] 6 ALLOWED ALLOWED ALLOWED ALLOWED ALLOWED
[Port 7] 7 ALLOWED ALLOWED ALLOWED ALLOWED ALLOWED
[Port 8] 8 ALLOWED ALLOWED ALLOWED ALLOWED ALLOWED
Allow All From
Deny All From
Toggle Selected Cell
Allow All
Deny All

Version Info Tab

The **Version Info** tab lists the currently installed versions.

Version Info Tab, Configure Switch Dialog Box


Configure Switch - "Vixel 7100" [Z1612345678] : 168.168.11.218 : [10:00:00:10:9B:82:00:09]
File Help
System Time Settings Ports Stealth-2 Stealth-3 Logging Zoning Version Info Device Info Options
System Image Running: 03.00 00116
FPP Version: 1.1
MIB Version: 01.20a
Serial Prom Version: 0
CCA Version:
Restart Stealth-3
Load Sample Config
Switch Read
Apply ALL
Successfully read configuration items from switch. Enter new settings, then Apply.

The fields displayed vary according to the switch model. Each field name is described below.

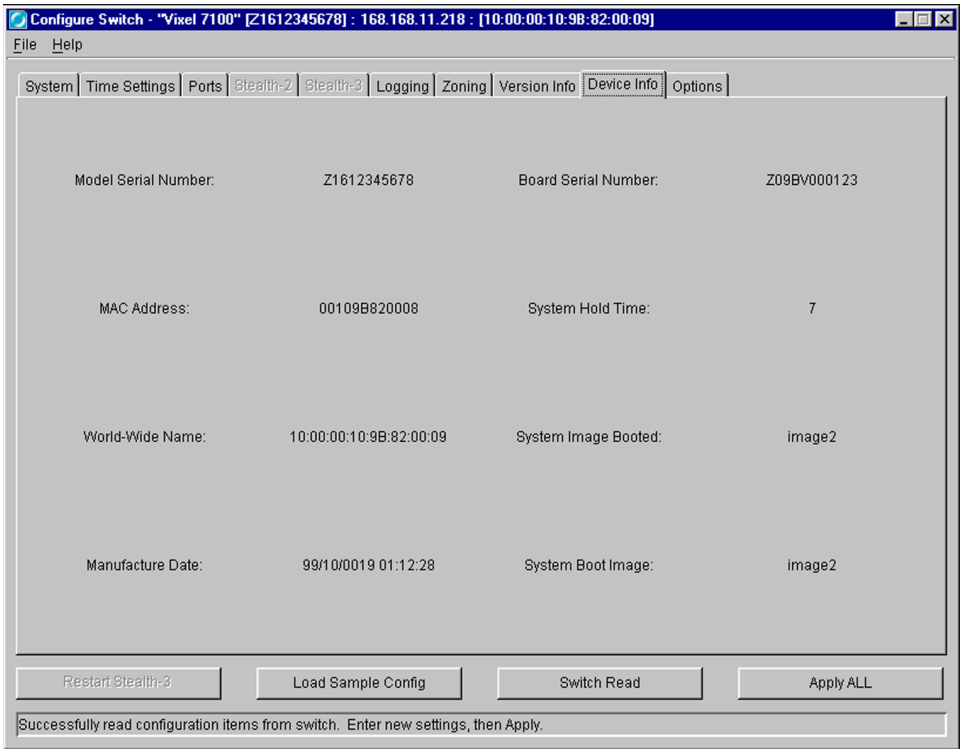
Version Info Tab

Field Name	***Description***
System Image Running	Active firmware.
HW Version Running	Active hardware.
FPP Version	The version of Fibre Port Protocol chip contained in the switch.
MIB Version	Active version of the Management Information Base, which is a database of object identifiers (OIDs) and values used in Softek SANView.
Serial Prom Version	Serial number for the programmable read-only memory.
CCA Version	Circuit Card Assembly number and revision.
RIP Version	Version number of routing internet protocol.
SNS Version	Version number of simple name server.

Device Info Tab

The **Device Info** Tab displays the factory device identification settings (read-only).

Device Info Tab, Configure Switch Dialog Box



☞ **NOTE:**
To configure a different firmware image, choose **Configure firmware image...** from the **Tools** menu (Switch window).

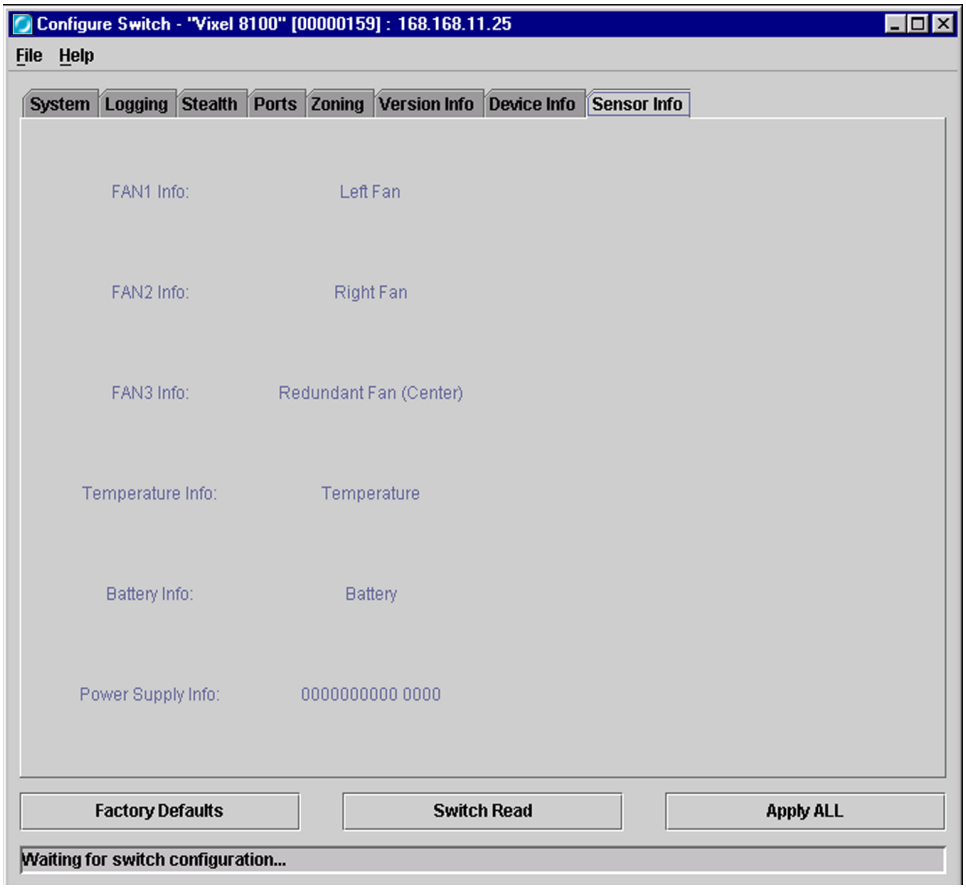
The currently running image is the **System Image Booted** while the image to run after the next boot is the **System Boot Image**.

Sensor Info Tab

The **Sensor Info** tab (available for Vixel 8100) lists relevant information for each available sensor.

☞ **NOTE:**
The status of these sensors is indicated in the Enclosure State window. To display this window, open the desired Switch window and choose **Enclosure state** from the **View** menu.

Sensor Info Tab, Configure Switch Dialog Box (shown for Vixel 8100)


Configure Switch - "Vixel 8100" [00000159] : 168.168.11.25
File Help
System Logging Stealth Ports Zoning Version Info Device Info Sensor Info
FAN1 Info: Left Fan
FAN2 Info: Right Fan
FAN3 Info: Redundant Fan (Center)
Temperature Info: Temperature
Battery Info: Battery
Power Supply Info: 0000000000 0000
Factory Defaults
Switch Read
Apply ALL
Waiting for switch configuration...

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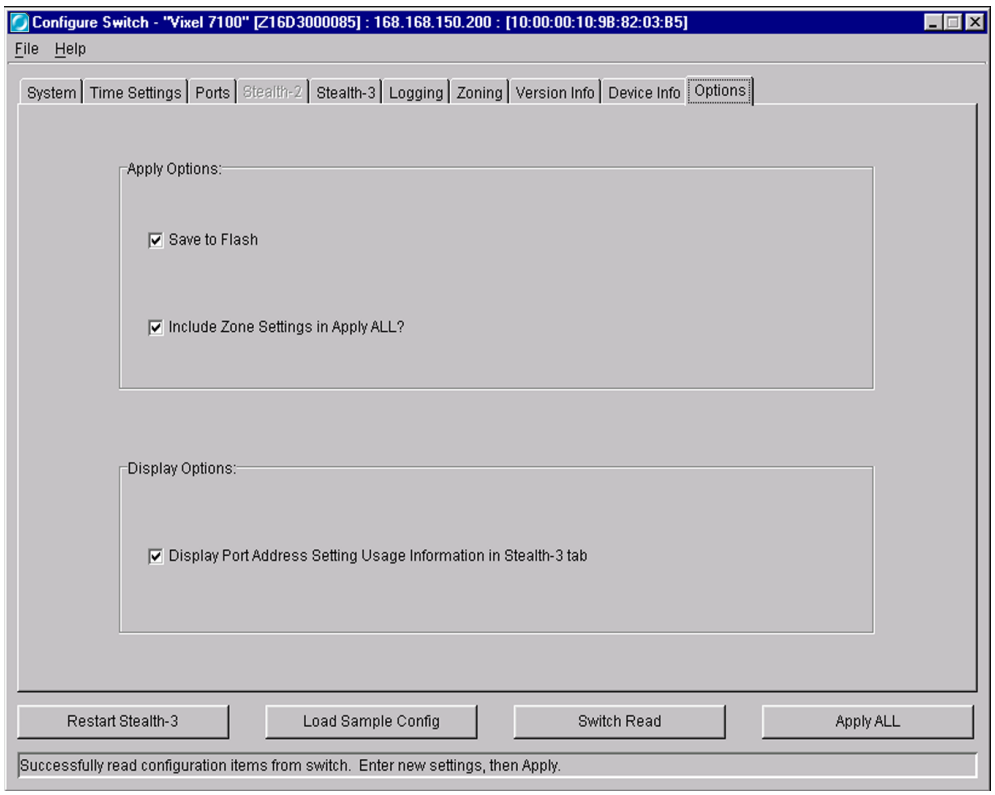
Options Tab

The **Options** tab (not available for Vixel 8100) allows you to configure the Apply ALL function to include or exclude the save-to-flash action and / or the zone settings; you can also disable the usage information display in the **Stealth-3** tab.

☞ **NOTE**:
Options tab settings are applied to all switches managed by Softek SANView.

Options Tab, Configure Switch Dialog Box



The options in the **Options** tab are described below.

Options Tab

Option Checkbox	***Description (When Checked)***
Save to Flash	When the **Apply ALL** button is clicked and the resulting RAM download is successfully completed (no configuration errors logged), causes the configuration settings to be copied to the switch flash, making the applied configuration permanent after the next switch reboot. (Default: Checked.)
Include Zone Settings in Apply ALL?	Causes the **Apply ALL** button to download zone configuration settings (from the **Zone** tab) to the switch along with all other configuration settings. (Default: Checked.)
Display Port Address Setting Usage Information in Stealth-3 Tab	Shows the Port Address Setting Usage Information message box when the **Stealth-3** tab is clicked. (Default: Checked.)

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Hub Window

- Overview 95
- Title Bar, LED Row, and Icons 96
- File Menu 98
- View Menu 99
- Options Menu 102
- Tools Menu 103
- Help Menu 104

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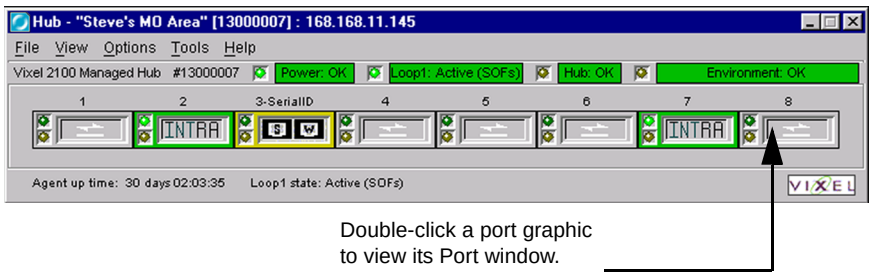
Overview

This section describes the functions and selections of the Hub window used for Vixel Hubs managed by Softek SANView. Each dialog box and window is referred to by the name that appears in its title bar.

☞ **NOTE**:
The data sent by a loop-attached node travels from the first port to the last port in sequential order.

The Hub window displays the hub identifier, management agent information (if present), ports, and GBIC types. Ports are color-coded to show their health status. The health status of the loop, hub, and GBICs is indicated by the LEDs shown below.

Hub Window



To open the Hub window, double-click the desired hub icon in the main window, or, if the hub is within a stack, double-click the desired stack icon in the main window and then double-click the desired hub graphic.

Title Bar, LED Row, and Icons

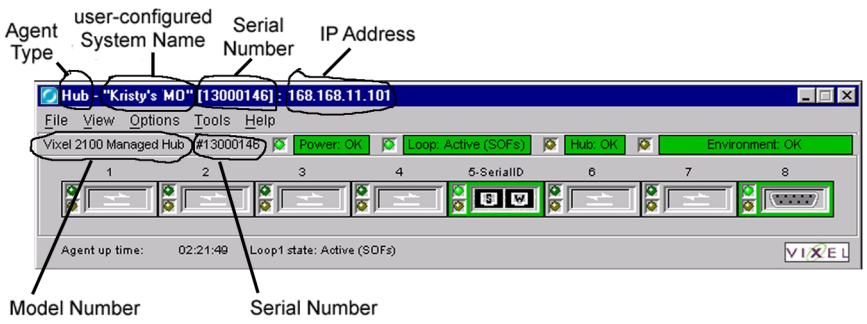
The title bar of the Hub window lists (from left to right):

- Agent Type (Hub)
- System Name in quotes (user-configured)
- Serial Number in brackets
- IP Address.

The LED row under the menus lists (from left to right):

- Model Number
- Serial Number
- Power LED
- Loop LED
- Hub LED
- Environment LED.

Hub window for a Vixel 2100, with explanatory call-outs for title bar and LED row



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LEDs are described below.

HUB LEDs

Hub LED	Green	Yellow
Power	OK	N/A—not shown if powered off.
Loop	OK (LoopUp or LoopActive)	• Non Operational (no comma characters are going around loop) • Initializing (a Loop Initialization Primitive (LIP) has been detected) • OpenInit (initialization frames are being transmitted and received to identify a loop master and assign AL_PA values) **Note:** For Vixel 2100 Managed Hubs with more than one zone, the Loop LED represents the most urgent state existing among the loops—to view each zone's state, choose **Show Zones** from the Options menu.
Hub	OK	• Internal hub failure—an internal failure was detected • Self-test failure—the Power-On Self Test (POST) failed and the system needs attention
Environment	OK	• Fan fault • Overtemp warning or fault

Port LEDs

Port LED	On	Off
Green (top)	The inserted GBIC is healthy. (normal operation)	Either no GBIC is inserted or the GBIC is unhealthy.
Yellow (bottom)	The port is bypassed due to a problem detected by either the GBIC's transmit logic or the GBIC receiver. Receiver problems include unconnected fiber, remote node not transmitting, LIP(F8), or a faulty GBIC receiver.	The port is not bypassed (normal operation).

The module icons (for SFPs and GBICs) are described below.

Module Icons for SFPs and GBICs

Module Icon	Module Type
	Intra Copper
	Inter Copper
	• FC LW Laser (Longwave) • Serial FC LW Laser (Longwave)
	• FC SW Laser (Shortwave) • Serial FC SW Laser (Shortwave)
	• DB-9 Serial Intra Copper • DB-9 Serial Inter Copper
	• HSSDC Serial Intra Copper • HSSDC Serial Inter Copper
	• GBIC Unknown • No Module

File Menu

The **File** menu allows you to close the window or exit the Softek SANView Client.

File Menu of Hub Window

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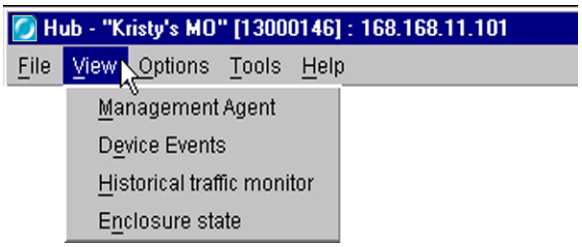
View Menu

The **View** menu has the options shown below.

View Menu of Hub Window



Management Agent displays the MAC address and other information hardcoded onto the agent.

Device Events lists the event messages read from the selected hub.

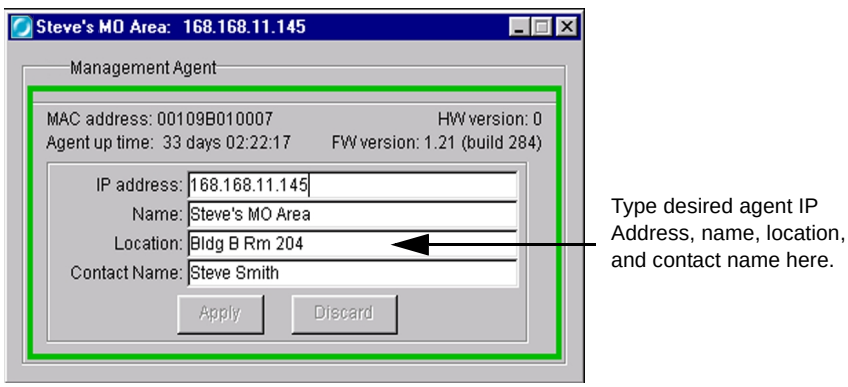
Historical traffic monitor measures traffic on the hub.

Enclosure state displays the current status of the hub's fans, airflow, temperature, and power supply.

Management Agent

Displays the Vixel dialog box shown below. The Vixel Management Agent dialog box displays the management agent's MAC address and hardware (HW) and firmware (FW) versions (all hardcoded onto the management agent). The FW version updates when you upgrade the firmware. Also displayed is the agent uptime (total time agent in management agent has been running since last agent reset or power cycle).

Vixel Management Agent Dialog Box


Steve's MO Area: 168.168.11.145
Management Agent
MAC address: 00109B010007
HW version: 0
Agent up time: 33 days 02:22:17
FW version: 1.21 (build 284)
IP address: 168.168.11.145
Name: Steve's MO Area
Location: Bldg B Rm 204
Contact Name: Steve Smith
Apply
Discard
Type desired agent IP Address, name, location, and contact name here.

You can specify the management agent's IP Address, name, location, and contact name by typing the desired parameters and clicking **Apply**.

Buttons in the Vixel Management Agent dialog box are described below.

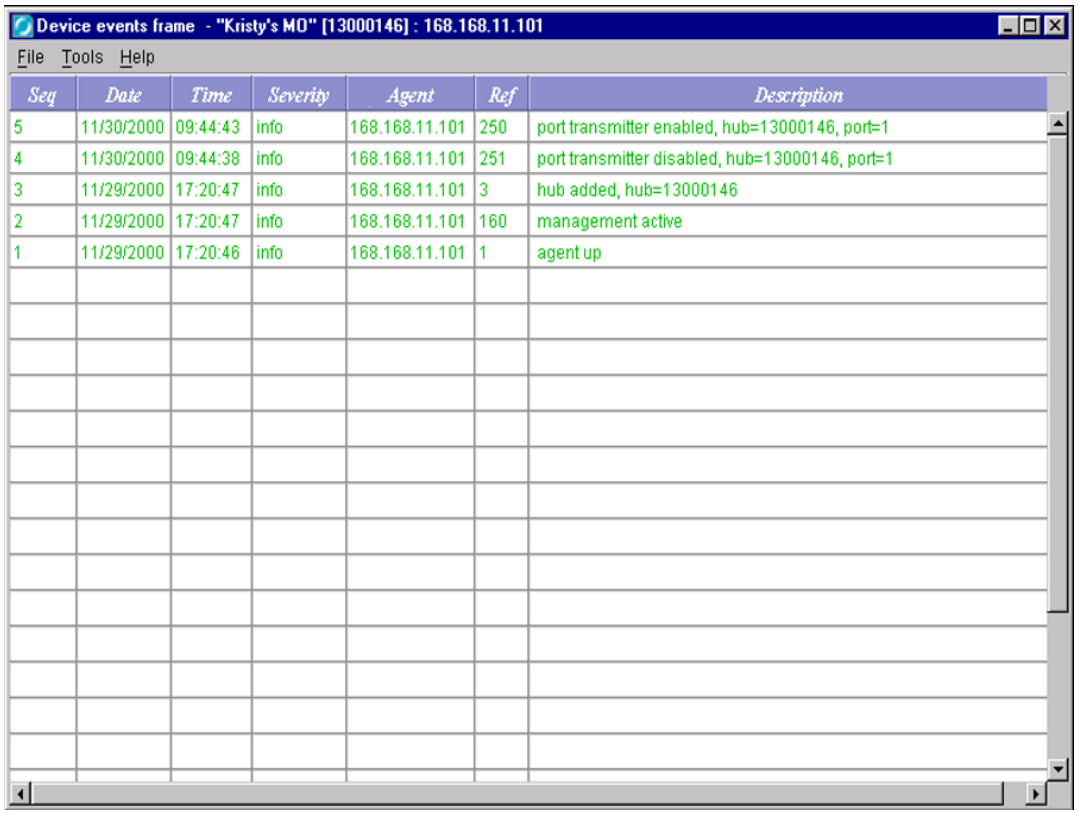
Buttons of the Vixel Management Agent

Button	Description
Apply	Saves the information that has been entered.
Discard	Clears the fields.

Device Events

Displays the Device Events window for the hub, as shown below.

Device Events window for a Vixel 2100 Managed Hub with Zoning


Device events frame - "Kristy's MO" [13000146] : 168.168.11.101
File Tools Help
Seq Date Time Severity Agent Ref Description
5 11/30/2000 09:44:43 info 168.168.11.101 250 port transmitter enabled, hub=13000146, port=1
4 11/30/2000 09:44:38 info 168.168.11.101 251 port transmitter disabled, hub=13000146, port=1
3 11/29/2000 17:20:47 info 168.168.11.101 3 hub added, hub=13000146
2 11/29/2000 17:20:47 info 168.168.11.101 160 management active
1 11/29/2000 17:20:46 info 168.168.11.101 1 agent up

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Historical Traffic Monitor

Displays the Historical Traffic Monitor window shown below, with port transmitter utilization shown for each selected port and zone.

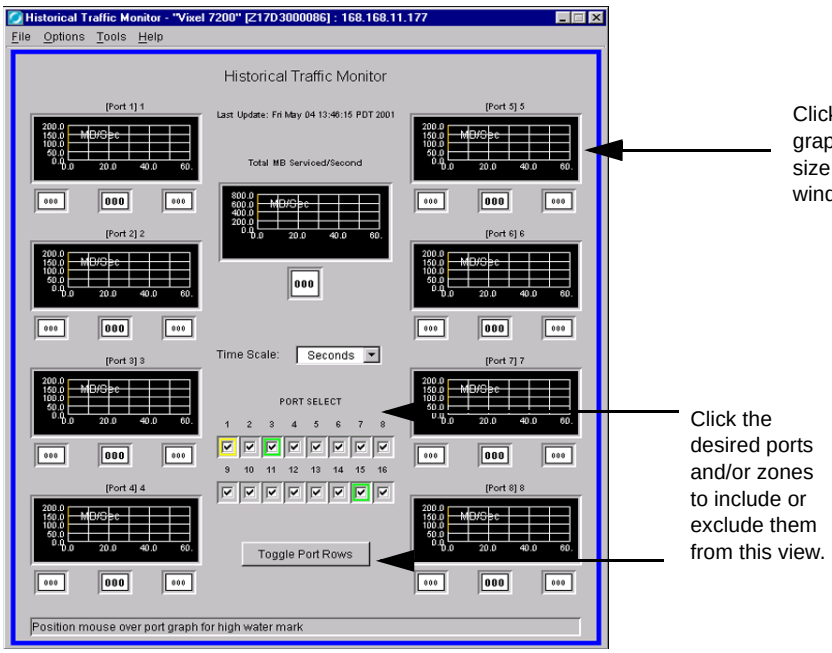
☞ **NOTE**:
Only frame data is measured; LIPs, ARBs, and IDLEs are ignored.

The port gauges on the Historical Traffic Monitor window measure port traffic by the percentage of bandwidth corresponding to the port received data only (the percentage is calculated by the hub's firmware as a port percentage of the loop's total bandwidth).

This performance monitoring feature can be used to determine the bandwidth used on the device's loop. Monitoring the bandwidth usage allows you to make informed decisions about the need to add devices or implement switches for increased throughput.

For information about configuration settings, see *The Historical Traffic Monitor Window* on page 7.

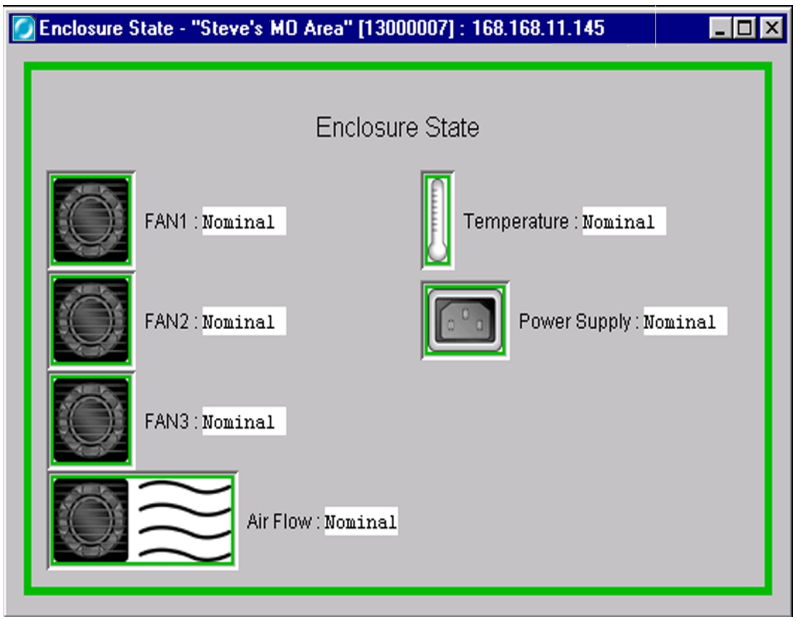
Historical Traffic Monitor Window


Historical Traffic Monitor - "Vixel 7200" [Z17D3000086] : 168.168.11.177
File Options Tools Help
Historical Traffic Monitor
Last Update: Fri May 04 13:46:15 PDT 2001
Total MB Serviced/Second
Time Scale:
Seconds
PORT SELECT
Toggle Port Rows
Position mouse over port graph for high water mark
Click the desired port graph to magnify its size in a separate window.
Click the desired ports and/or zones to include or exclude them from this view.

Enclosure State

Displays the current status of the hub's fans, airflow, temperature, and power supply in the Enclosure State window shown below.

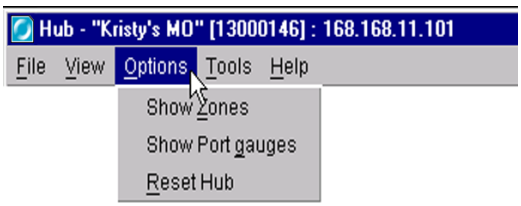
Enclosure State Window



Options Menu

The **Options** menu contains the options shown below.

Options Menu of Hub Window (with port gauges shown)



Show Zones displays the health state of each zone.

Show Port gauges indicates which ports are transmitting data.

Reset Hub reinitializes the hub and attempts to reinsert all valid ports.

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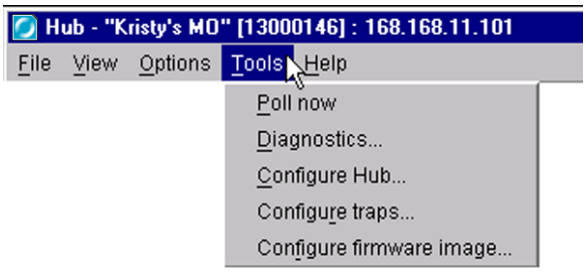
Tools Menu

The **Tools** menu has the options shown below.

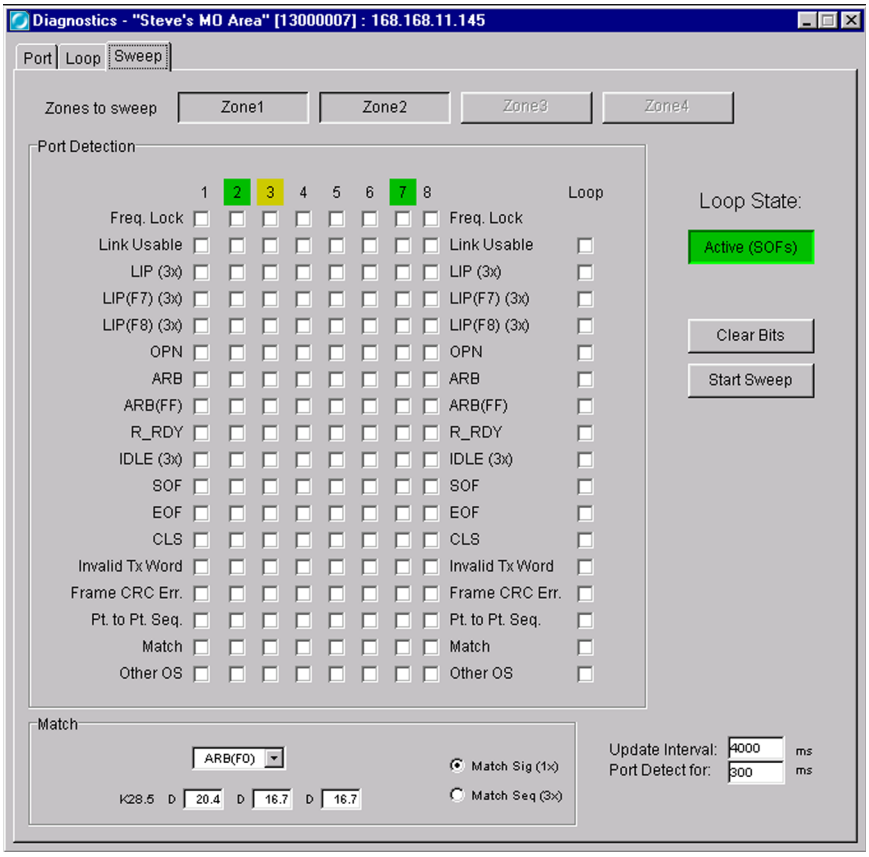
Tools Menu of Hub Window



Poll now immediately polls the hub for information instead of waiting for the next Softek SANView poll interval.

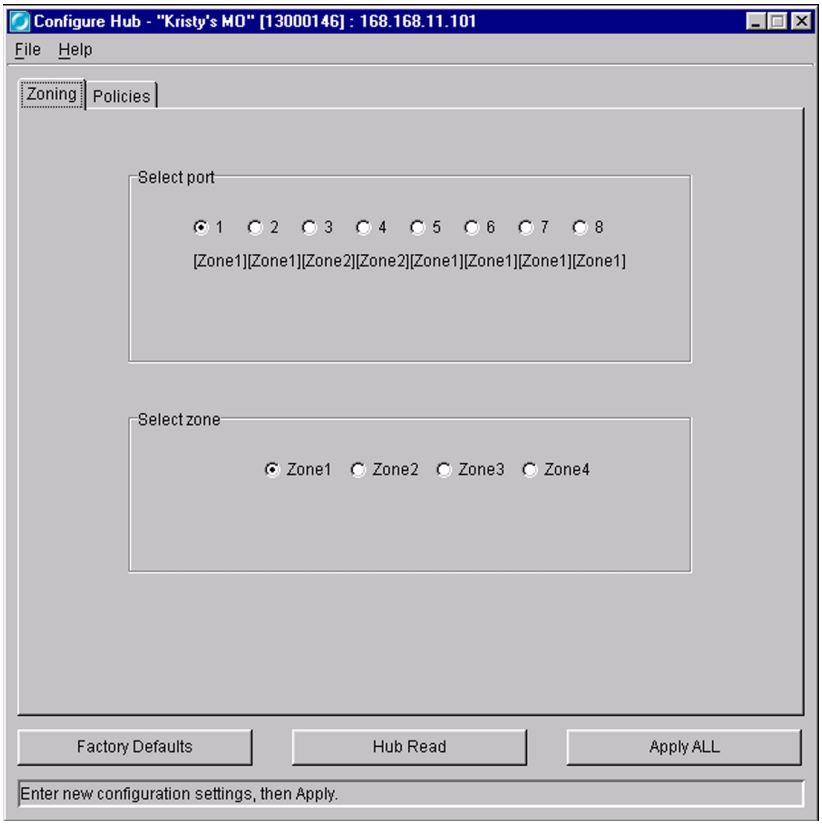
Diagnostics displays the Diagnostics dialog box shown below. For an in-depth look at all information in this dialog box, see *Hub Diagnostics Dialog Box* on page 119.

Diagnostics Dialog Box



Configure Hub displays the Configure Hub dialog box shown below. For an in-depth look at all information in this dialog box, see *Configure the Hub Dialog Box* on page 111.

Configure Hub Dialog Box



Configure traps... displays the Trap Configuration dialog box. For information on the selections in this dialog box, see *The Trap Configuration Dialog Box* on page 21.

Configure firmware image... displays the Firmware Image Configuration dialog box. For information on the selections in this dialog box, see *The Firmware Image Configuration Dialog Box* on page 13.

Help Menu

The **Help** menu contains two options: **Contents** displays the online help display and **About Softek SANView...** displays version and system information, including current port-based license and version numbers of installed modules.

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Port Window

- Hub Port Window 107

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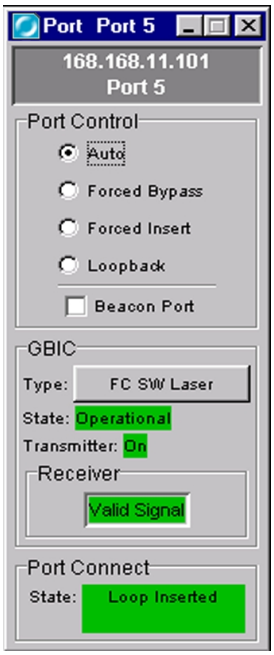
Hub Port Window

This section describes the functions and selections of the Port window used for Vixel Hubs managed by Softek SANView. The Port window displays the currently selected port control, GBIC type, and state of the port connection. If one of your ports is not receiving a valid Fibre Channel signal, be sure to check the physical connections and the signals from the devices on this node.

Port window for an FC SW Laser GBIC on a Vixel 2100



▶ **To open the Port window:**

- Double-click the desired port in the Hub window.

Listed below are Port Control descriptions and possible field values.

Port Control Descriptions

Port Control	***Description***
Auto	The default port mode (and the default mode for an unmanaged hub). The hub must be able to derive: 1. A valid clock 2. Valid Fibre Channel "K28.5" characters 3. No LIP(F8)s from the port's receiver and the ability to LIP(F7) 4. This prevents "rogue" ports from being inserted and potentially disrupting the loop.
Forced Bypass	This control is used to force a port into bypass mode and can be used to selectively non-intrusively remove devices from the loop while troubleshooting.
Forced Insert	This control can be used to force an insertion of a port into the loop, regardless of whether a valid clock or "K28.5" character is derived from the port's receiver. **WARNING: Use carefully as a "Forced Insert" can cause the loop to go down if a device without valid characters puts bad data onto the loop.**
Loopback	You can use this control to isolate a specific loop for troubleshooting and fault isolation. Loopback forces the port into "bypass" mode and routes the ports receive signal back through the port's transmitter. Use Loopback to test the GBIC's transmitter/receiver circuitry and attached media from the attached node.
Beacon Port	Forces both port's LEDs to flash on and off (beacon) continuously to bring attention to the selected port. Use to alert a remote technician to take action on a specific port as identified by a Systems Administrator. The blinking will override the state information display until the beaconing is turned off.

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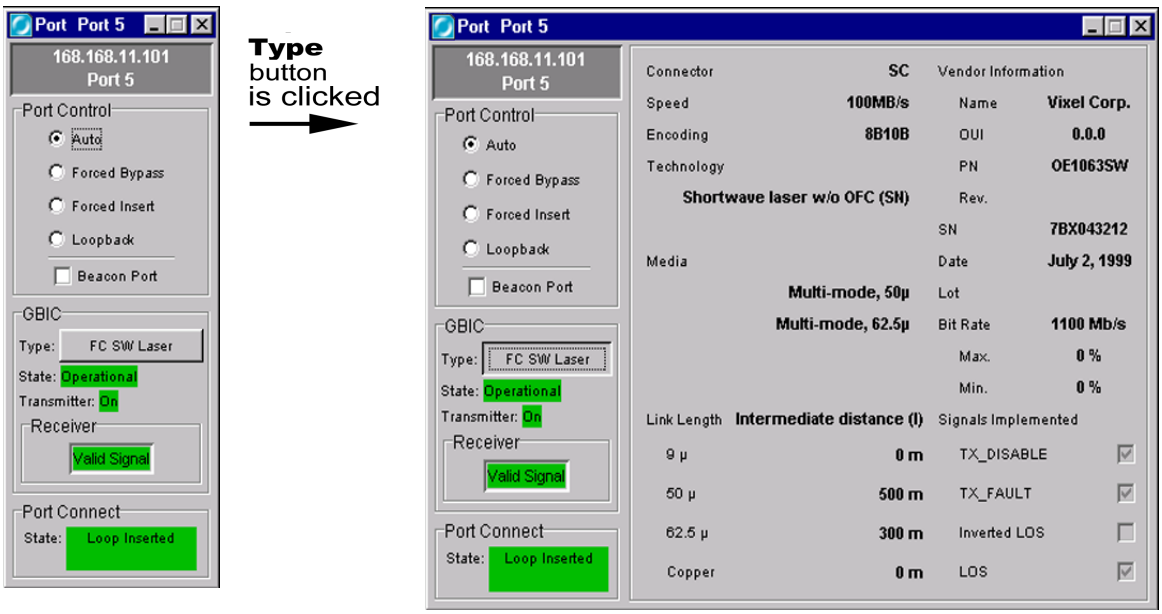
Port Control Values

Field	Possible values
GBIC Type	• DB-9 Serial Inter Copper • DB-9 Serial Intra Copper • FC LW Laser (Longwave) • FC SW Laser (Shortwave) • GBIC Unknown • HSSDC Serial Inter Copper • HSSDC Serial Intra Copper • Inter Copper • Intra Copper • No Module • Serial FC LW Laser (Longwave) • Serial FC SW Laser (Shortwave)
GBIC State	• Beaconing • Faulty GBIC • Manual • No Module • No Valid Data • Operational
Transmitter	On Off **Note:** You can turn the GBIC transmitter on or off through the Port tab in the Diagnostics dialog box.
Receiver	• Valid Signal • No Valid Signal
Port Connect State	• Auto Bypassed - LIP (F8) (Red) • Auto Bypassed - No Comma (Red) • Bypassed (Yellow) • Forced Bypassed - Diagnostic Tx (Yellow) • Loop Inserted (Green) • LoopedBack (Yellow) • TxFault (Red)

▶ **To view capability and vendor information for a Serial ID GBIC:**

Click the **Type** button (under GBIC). Port windows for Serial ID GBICs allow you to see information about the GBIC's capability and vendor, as shown below.

*Port window for an IntraCopper Serial ID GBIC, before and after clicking the **Type** button*



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12

Configure the Hub Dialog Box

- Overview 113
- File Menu 113
- Help Menu 115
- Zoning Tab 116
- Policies Tab 117

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Overview

This section describes the functions and selections of the Configure Hub dialog box, which is used to configure Vixel Hubs within Softek SANView.

Each dialog box and window is referred to by the name that appears in its title bar.

The Configure Hub dialog box allows you to configure zones and set policies through the following tabs:

- Zoning – Allows you to add or remove ports from desired zones.
- Policies – Allows you to define port insertion policies.

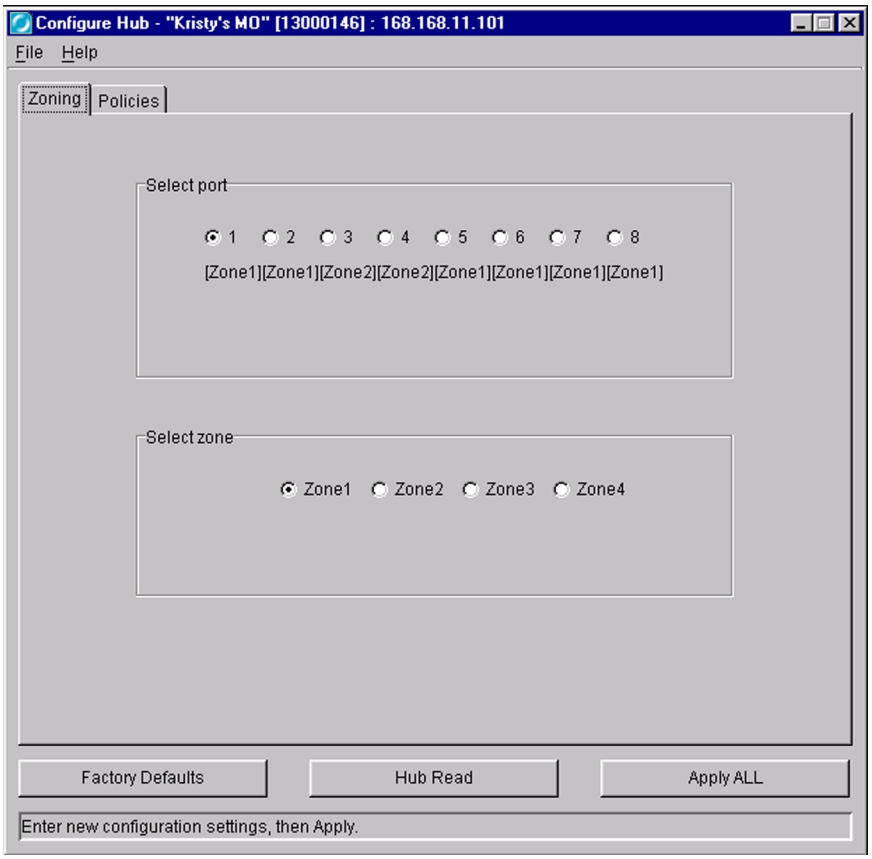
This section provides an in-depth look at all information in the Configure Hub dialog box.

☞ **NOTE:**
The Zoning tab is visible only when the zoning feature has been enabled on the hub. If the zoning feature is not yet enabled, the Zoning tab is grayed out.

▶ **To open the Configure Hub dialog box:**

- Choose **Configure Hub...** from the **Tools** menu of the desired Hub window.

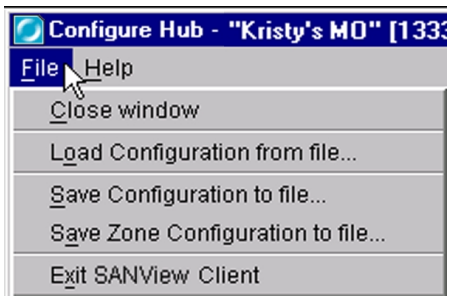
Configure Hub Dialog Box



File Menu

Between the standard **Close window** and **Exit Softek SANView Client** options in the **File** menu are several options for opening, loading, closing, and saving configurations. You can save configuration files to record a particular set of configurations or to download at a later time

File Menu for the Configure Hub Dialog Box



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Load Configuration from file... opens a previously saved configuration file or zone configuration file. Make sure you click **Apply ALL** if you want to download this configuration information to the hub.

Save Configuration to file... saves the configuration information shown in the Configure Hub dialog box (all tabs) to a file.

Save Zone Configuration to file... saves the zoning configuration information shown in the Configure Hub dialog box (Zoning tab and zoning-specific policies only) to a file.

All device configuration files are saved to the appropriate vendor directory in*:

- (Windows) `C:\SANView\`SIFileSystemRoot\deviceconf\
- (UNIX) /opt/SANView/SIFileSystemRoot/`deviceconf/`

*Files are located on the Softek SANView Server system. The listed locations assume that the default installation directory for Softek SANView was accepted and that Softek SANView's Root Directory parameter is unchanged. (By default, Softek SANView's Root Directory is named "SIFileSystemRoot" and is placed inside the accepted installation directory.)

Help Menu

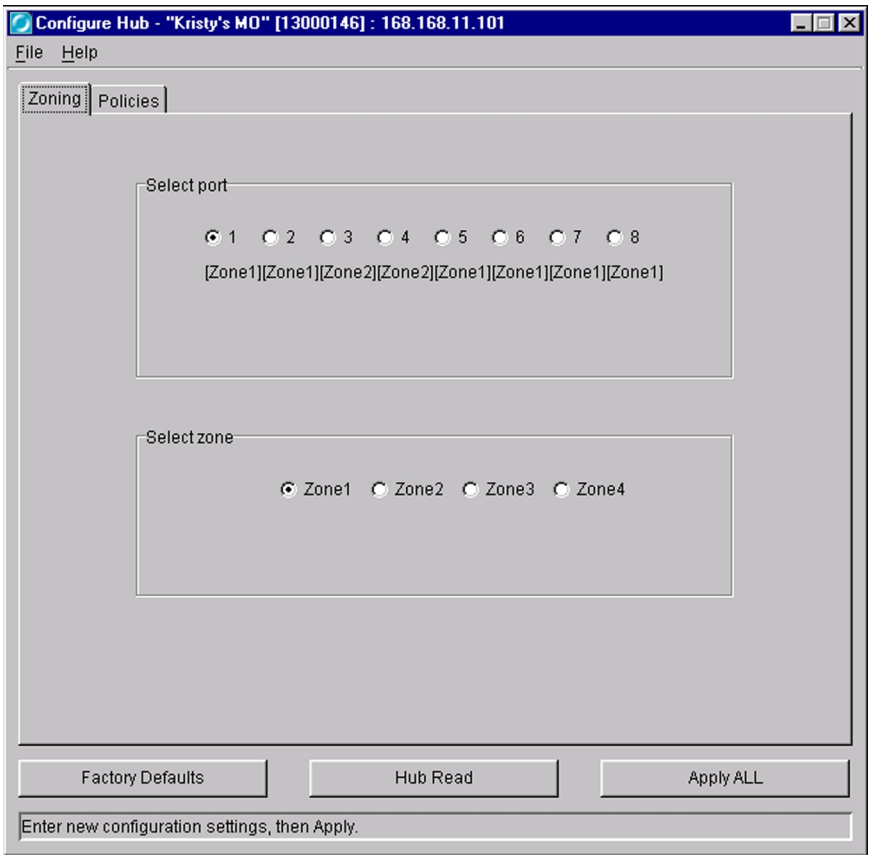
The **Help** menu contains two options: **Contents** for online help display and **About** for system and version information.

Zoning Tab

The **Zoning** tab contains an area to select a port and an area to select a zone. The current zone settings are shown beneath each port.

Set zones one port at a time by selecting a port, selecting a zone, and then clicking **Apply ALL.**

Zoning Tab



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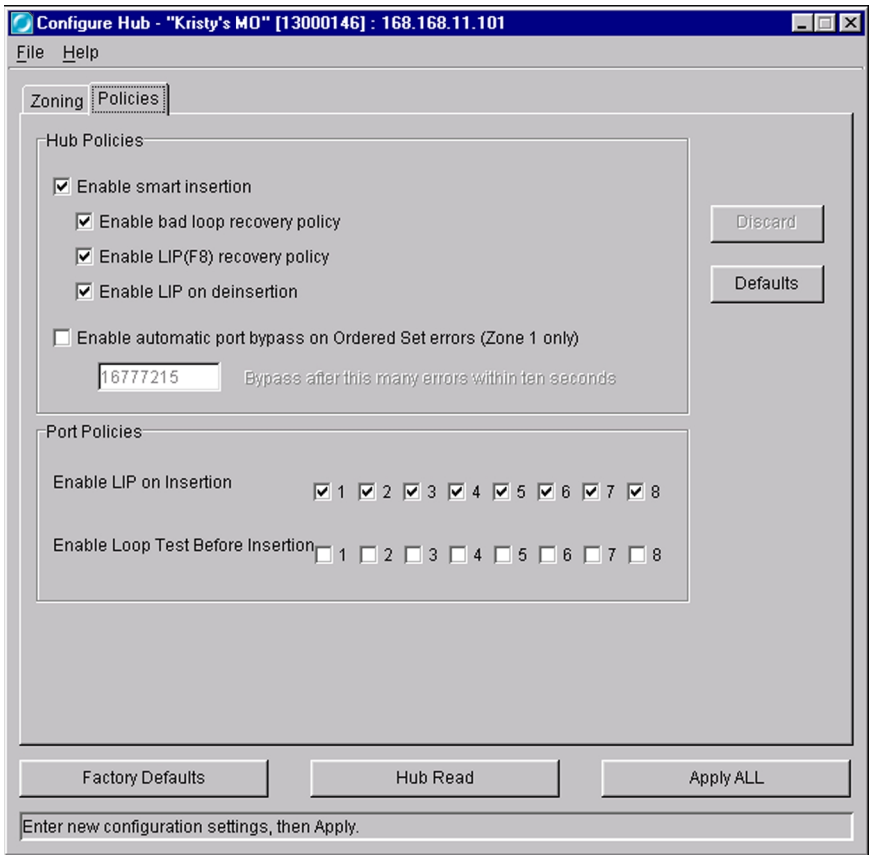
Policies Tab

The **Policies** tab allows you to set hub, port, and zone policies.

Policies Tab


Configure Hub - "Kristy's MO" [13000146] : 168.168.11.101
File Help
Zoning Policies
Hub Policies
Enable smart insertion
Enable bad loop recovery policy
Enable LIP(F8) recovery policy
Enable LIP on deinsertion
Enable automatic port bypass on Ordered Set errors (Zone 1 only)
16777215
Bypass after this many errors within ten seconds
Discard
Defaults
Port Policies
Enable LIP on Insertion
1 2 3 4 5 6 7 8
Enable Loop Test Before Insertion
1 2 3 4 5 6 7 8
Factory Defaults
Hub Read
Apply ALL
Enter new configuration settings, then Apply.

The **Discard** button cancels any changes and displays the current policy settings.

The **Defaults** button displays the factory default values for policy settings.

Vixel 2100 Managed Hub policies are described below.

Vixel 2100 Managed Hub Policies

Hub Policy	***Description***
Enable smart insertion	Before allowing a port to insert, the hub ensures that signal on the port's input has the following characteristics: • Locked onto by the Phase Lock Loop. • Valid Fibre Channel LIP behavior.
Bad loop recovery policy*	The hub reinitializes the loop, then allows only those ports with valid Fibre Channel LIP behavior to insert, when one of the following situations occur: • Frequent bad comma characters exist in the passed ordered sets. • Initialization takes a long time. • Other bad loop indications exist.
LIP(F8) recovery policy*	When the hub detects LIP(F8)s (indicating non-functional loop), it reinitializes the loop, then allows only those ports *not* sending LIP(F8)s to insert.
LIP on deinsertion*	The hub requires a bypassed port to announce its status by issuing LIP(F7)s to other loop members.
automatic port bypass on Ordered Set errors	When a port exceeds the threshold of Ordered Set errors within ten seconds, the hub bypasses the port. **Note:** The threshold can be changed. (The maximum expected error rate is one error within 15 minutes.)
LIP on Insertion	When a port inserts onto a loop, it issues LIP(F7)s to other loop members.
Loop Test Before Insertion	Before allowing a port to insert onto the loop, the port is looped back and monitored for proper Loop Port State Machine (LPSM) protocols. (At least one of the devices on the port must be a Loop Initialization Master (LIM) to follow these protocols.)
* To set this policy, first set **Enable smart insertion** (make sure it is checked).	

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Hub Diagnostics Dialog Box

- Overview 121
- Sweep Tab 122
- Loop Tab 126
- Port Tab 128

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Overview

This section describes the functions and selections of the Diagnostics dialog box used for Vixel Hubs managed by Softek SANView.

Each dialog box and window is referred to by the name that appears in its title bar.

☞ **NOTE:**
This section provides an in-depth look at all information in the Diagnostics dialog box.

The Diagnostics dialog box allows you to control and troubleshoot Fibre Channel arbitrated loops through the following tabs:

- Sweep – Detects and displays presence of ordered sets on ports to isolate problems.
- Loop – Detects AL_PAs.
- Port – Allows you to select, monitor and control a specific port in a hub.

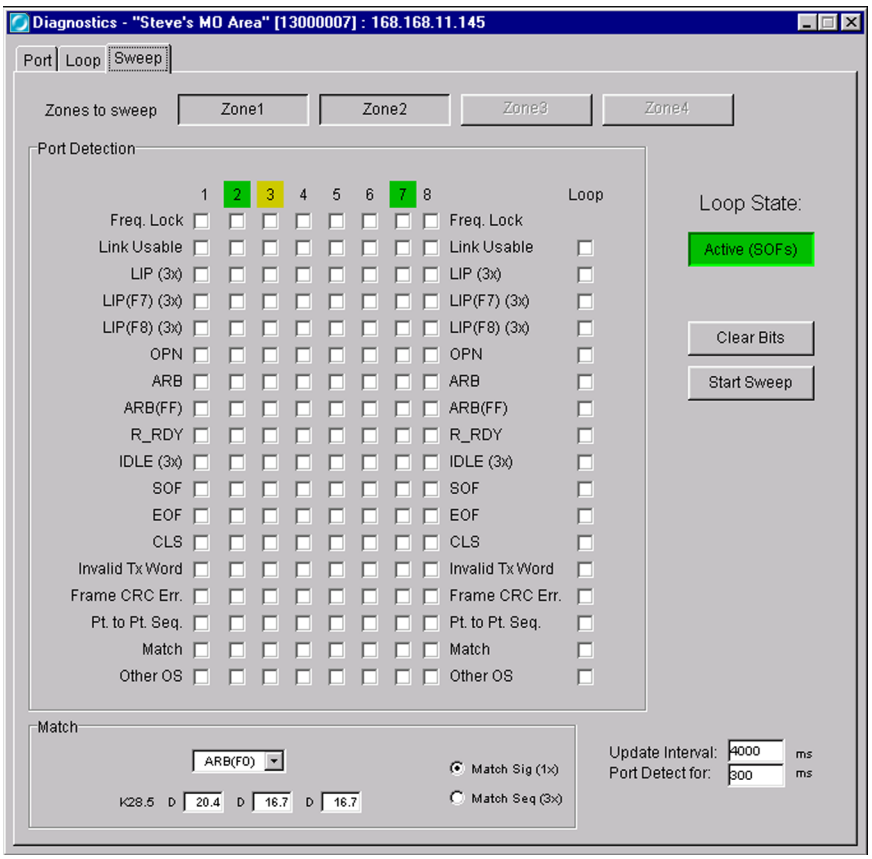
▶ **To open the Diagnostics dialog box:**

- First open the desired Hub window, then choose **Diagnostics...** from the **Tools** menu. The Diagnostics dialog box appears with the Sweep tab displayed.

Sweep Tab

The **Sweep** tab in the Diagnostics dialog box analyzes, assesses, and troubleshoots loop operation. Through the Sweep tab's capabilities, you can detect and display the presence of the ordered sets to immediately pinpoint a problem port.

Sweep Tab



The Sweep process continually monitors installed ports in sequential order, displaying real-time status through color. (Green, yellow, or red indicates status while gray indicates that the port has no installed GBICs.) The detected ordered sets are indicated through the checkboxes under Port Detection.

☞ **NOTE:**
Invalid Sweep data may be acquired from a port if a GBIC is inserted or removed from the hub during that Sweep cycle. Correct data is displayed during the next Sweep cycle.

You can define the amount of time spent on each port and between ports.

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Information in this dialog box is described in the tables below.

Sweep Tab Options 1

Field	***Possible values***
Loop State	• Active (SOFs) - Data is going around the loop. Loop is up. • Down - No Comma characters are going around the loop. • Initializing - LIP(s) have been detected on the loop. • OpenInit - Initialization frames are being transmitted and received in order to identify a loop master and assign AL_PA values. • Up - A loop master has been identified and AL_PA values have been assigned.

Sweep Tab Options 2

User Entry or Selection	***Function***	***Default Value***
Update interval	Determines the number of milliseconds between sweep intervals.	4000
Port Detect for	Determines the number of milliseconds that Sweep monitors a specific port before moving on to the next port.	300 (valid range is 300 - 15,000)
(ordered set pull-down menu) under Match	Lists ordered sets that can be selected for matching.	ARB F(0)
K28.5 “D” fields under Match	Allows you to define the pattern to be matched by filling in valid Fibre Channel data characters in the “D” fields. For example, you could select the OPN ordered set from the Match pull-down menu, then add the specific source and destination AL_PA values to the “D” fields to find a more specific match than the standard OPN( ) from the pull-down menu.	--
Match Sig (1x)	Constitutes a match with one occurrence of the ordered set.	(selected)
Match Seq (3x)	Constitutes a match with three consecutive occurrences of the ordered set.	(not selected)

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Sweep Tab Options 3

Button	***Description***
Clear Bits	Clears checked boxes from each port in the display.
Start Sweep / Stop Sweep	Toggles Sweep process on or off. When toggled on, Sweep stays in effect until toggled off or a different tab is selected.

Sweep Tab Options 4

Port Detection Field*	***Indication***
Freq. Lock	Phase Locked Loop (PLL) Lock has been achieved.
Link Usable	The link is useable.
LIP (3x)	A Loop Initialization Primitive (LIP) sequence has been detected and action has been taken.
LIP(F7) (3x)	A loop port is in the non-participating mode and is attempting to win arbitration and begin initialization, possibly because the port was reset or is powering up. Sometimes the port is sending this sequence to another, hot-cascaded hub.
LIP (F8) (3x)	A loop port has detected a loop failure on its receive input, is notifying other ports, and is determining whether the loop is still operational. Some events that could cause the port to detect loop failure follow: • A device on the loop has failed. • A device on the loop has been powered off. • The physical connection between the transmitter and receiver is broken. Activating the port bypass circuit does not typically result in a loop failure.
OPN	The port is attempting to open communications with another port on the loop. **Note:** As is the case with some ordered sets, an OPN may not go all the way around the loop, instead stopping at its destination.
* "(3x)" means three consecutive occurrences have been detected.	

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Sweep Tab Options 4

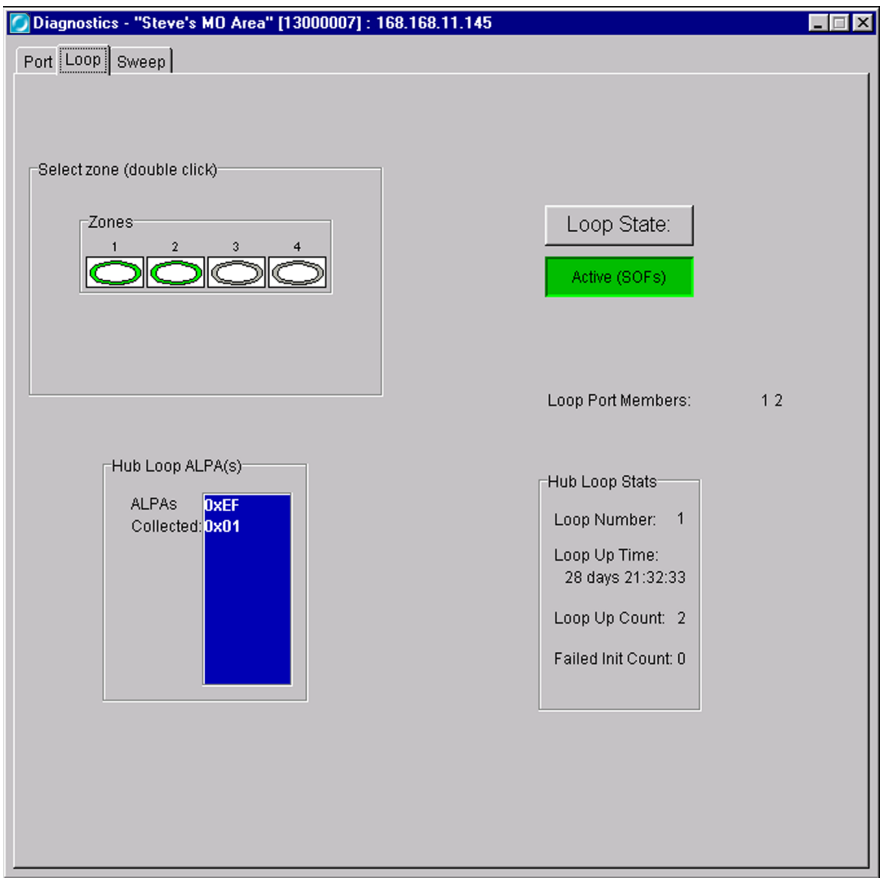
Port Detection Field*	***Indication***
ARB	A port is arbitrating for loop access.
ARB(FF)	ARB(FF)s are being transmitted to maintain link activity; no other data is being transmitted.
R_RDY	The receiving node on this port has sent an R_RDY signal, indicating that it is ready for a frame to be transmitted over the link.
IDLE (3x)	Sequences of IDLES are being transmitted to maintain link activity; no other data is being transmitted.
SOF	A Start-of-Frame (SOF) delimiter has been detected; frames are present on the loop.
EOF	An End of frame (EOF) delimiter has been detected; frames are present on the loop. (An EOF immediately follows the CRC of a frame and signals the frame's end.)
CLS	The port is attempting to begin the process of closing the current loop circuit.
Invalid Tx Word	An invalid transmit word has been detected.
Frame CRC Err.	A Frame CRC error has been detected.
Pt. to Pt. Seq.	A point-to-point sequence has been detected.
Match	The ordered set or pattern selected under the Match area has been detected.
Other OS	An ordered set other than those displayed above has been detected.
* "(3x)" means three consecutive occurrences have been detected.	

Loop Tab

The **Loop** tab in the Diagnostics dialog box displays the state of the loop. AL_PAs for the selected zone (loop) are automatically displayed.

☞ **NOTE:**
AL_PAs are not currently detected on version 1.0 firmware for Vixel 2100 Managed Hubs.

Loop Tab



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The Loop tab fields and selections are described below.

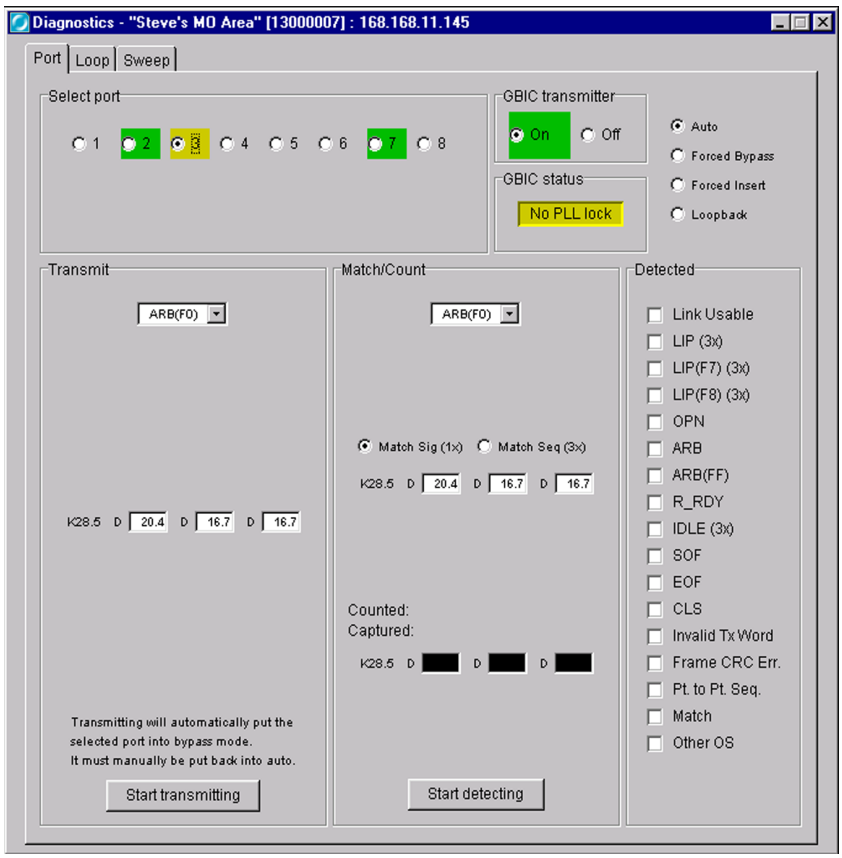
Loop Tab Options

Loop Tab Control	***Description***
Loop State (double-click the desired zone to display its loop state)	Health status of the loop. Possible values follow. • Active (SOFs) - Data is going around the loop. Loop is up. • Down - No Comma characters are going around the loop. • Initializing - LIP(s) have been detected on the loop. • OpenInit - Initialization frames are being transmitted and received in order to identify a loop master and assign AL_PA values. • Up - A loop master has been identified and AL_PA values have been assigned.
Hub Loop Stats	• Loop Number - (Vixel 2100 Managed Hubs only) Loop (zone) to which the displayed information applies. • Loop Up Time - Time accrued since last loop initialization • Loop Up Count - Number of times loop has completed initialization • Failed Init Count - Number of times loop did not complete initialization
Hub Loop ALPAs	Lists the ALPAs collected.

Port Tab

The **Port** tab allows you to select, monitor, control and transmit ordered sets to a specific port. Use the Port tab to ensure—without disrupting the arbitrated loop—that a newly added device follows the Fibre Channel protocol.

Port Tab



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The **Port** tab controls are described below.

Port Tab Options 1

Port Control Mode	***Description***
Auto	The default port mode. The hub must be able to derive a valid clock, valid "K" characters, no LIP (F8)s from the port's receiver and the ability to LIP (F7) before permitting a port to join the loop. This mode prevents insertion of "rogue" ports that could disrupt the loop.
Forced Bypass	This mode removes a port from the loop. Use this mode to troubleshoot ports.
Forced Insert	This mode allows ports whose receivers cannot derive a valid clock or "K" character to join the loop. **WARNING: Use carefully—devices without valid characters may put bad data into the loop, causing the loop to go down.**
Loopback	This mode removes a port from the loop and routes the port's receive signal back through the port's transmitter. Use this mode to isolate a specific loop for troubleshooting or test a GBIC's transmitter/receiver circuitry and attached media from the node end.

Port Tab Options 2

User Entry or Selection	***Function***
Select Port	Allows the user to select a port to control or monitor. The ports are color-coded to show status.
GBIC transmitter	The user can turn on/off the GBIC's transmitter in the selected port. (Default: On.)
GBIC status	Displays the status of the GBIC's receiver.
(pull-down list of ordered sets) under Transmit	Allows the user to select an ordered set for transmission.
K28.5	Defines a specific ordered set by placing valid Fibre Channel data characters in the "D" fields.

Port Tab Options 2

User Entry or Selection	***Function***
Start transmitting / Stop transmitting (toggle button)	Initiates or stops the transmission of the selected ordered set. **Note:** Transmitting will automatically put the selected port into bypass mode. It must manually be put back into auto to rejoin the loop.
(pull-down list of ordered sets) under Match / Count	Allows the user to select an ordered set to match on.
Match Sig (1x)	Constitutes a match with one occurrence of the ordered set.
Match Seq (3x)	Constitutes a match with three consecutive occurrences of the ordered set.
K28.5 “D” fields	Allows the user to define the pattern to be matched by filling in valid Fibre Channel data characters in the “D” fields. An example would be to select the OPN ordered set from the Match pull-down menu, then add the specific source and destination AL_PA values to the “D” fields. This would be a more specific match than the standard OPN( ) from the pull-down menu.
Counted	Number of “D” character ordered sets that were detected during the detection time. (All three of the K28.5 “D” fields must be filled in.) **Note:** The maximum number of ordered sets that can be counted by Softek SANView is 1,048,575. Typical counts do not reach this maximum.
Captured	Displays an ordered set that was matched or transmitted.
Start detecting / Stop detecting (toggle button)	Initiates or stops the trigger for detecting the selected match.
Detected	Displays common ordered sets that have been detected.

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Glossary

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Agent - An interface used by a device to exchange event messages, configuration settings, and other information with management applications. All device management commands issued through Softek SANView are communicated through the device's agent.

AL_PA or Arbitrated Loop Physical Address - A one-byte value used to identify a port in an Arbitrated Loop topology. The value of the AL_PA corresponds to bits 7:0 of the 24-bit Native Address Identifier.

Arbitrated Loop - A Fibre Channel topology structured as a loop and requiring a port to successfully arbitrate prior to establishing a circuit to send and/or receive frames.

ExpertMode port setting - A port setting under Stealth-3 Mode that allows assignment of individual addresses, offering SAN designers optional control of SAN addressing down to the individual node level.

Full-Duplex Transmission - Transmission in both directions, simultaneously (transmitting on one, receiving on the other).

Fibre Channel - Fibre Channel is a 1 gigabit per second data transfer interface technology that maps several common transport protocols including IP and SCSI, allowing it to merge high-speed I/O and networking functionality in a single connectivity technology. Fibre channel is an open standard as defined by ANSI and OSI standards and operates over copper and fiber optic cabling at distances of up to 10 Kilometers. It is unique in its support of multiple inter-operable topologies including point-to-point, arbitrated-loop and switching and it offers several qualities of service for network optimization. With its large packet sizes, Fibre Channel is ideal for storage, video, graphic and mass data transfer applications.

GBIC - Giga-Bit Interface Converter Module. Open Standard developed by Vixel Corp., Sun, Compaq, and Amp. Industry's first hot pluggable, gigabit transceiver.

InstantLoop port setting - A port setting under Stealth-3 Mode that automatically assigns addresses in minimum time with maximum interoperability. Addresses are assigned to ports in this mode last, after ports in other modes.

Intra-Loop Communication Range port setting - A port setting under Stealth-3 Mode that assigns the selected address range to the port.

LED - Light-Emitting Diode. A status indicator on a hub or switch.

Mb/s - Megabits per second, 1,024,000 bits per second.

MB/s - Megabytes per second, 8,192,000 bits per second.
One byte = 8 bits

Node - An entity with one or more N_Ports or NL_Ports.

SFP - Small Form-Factor Pluggable. These transceivers are fully compliant with the Gigabit Ethernet standard and occupy less than half the board space of the existing GBIC products.

Stealth-2 Mode - A switch mode that assigns addresses to ports based on the selected port type and device type.

Stealth-3 Mode - A switch mode that assigns addresses to ports based on the chosen port setting.

Topology - The logical and / or physical arrangement of stations on a network. Fibre Channel topologies include point-to-point, Arbitrated Loop, and switched fabric.

Transceiver - A device that converts one form of signaling to another for both transmission and reception. SFPs and GBICs are transceivers.

WWN Zoning - A feature of some switches by which devices are segregated by their World-wide Names (or some variant, such as World Wide N_Port_Names). WWN zoning configuration for Vixel Switches is currently available through the switch's Web Manager or CLI, both of which can be launched through Softek SANView.

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Revision History

This revision history lists all revisions of this publication and their effective dates.

Revision Level	Change Summary
ML-144957-001 August 2001	Original release of this manual.
ML-144957-002 November 2001	This edition provides technical and editorial updates and replaces the previous edition of this manual.

Softek SANView

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